

# **Chicago Operations Office Environmental Management Program Accelerating Cleanup: Focus on 2006**

Annotated Outline

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# **Chicago Operations Office Environmental Management Program Discussion Draft**

## **Executive Summary**

The Chicago Operations Office (CH), located at the Argonne National Laboratory site in Illinois, is responsible for a wide variety of programs in basic and applied research and development. Activities of interest include research in: supporting the nation's advance reactor program; the fundamental properties of matter; the physical, life and environmental sciences; experiments with magnetic confinement fusion and; high energy physics. These research activities are conducted at a variety of government-owned installations, single-purpose research installations, multiprogram national laboratories, and university and industrial contractors. These CH sites include Ames Laboratory, Argonne National Laboratory-East and West, Brookhaven National Laboratory, Environmental Measurement Laboratory, Fermi National Accelerator Laboratory, New Brunswick Laboratory, and Princeton Plasma Physics Laboratory. Additionally CH is responsible for environmental surveillance and maintenance activities at Site A/Plot M, Piqua Nuclear Power Facility and Hallam Nuclear Power Facility. A map of these facilities is attached.

## **Site Summaries**

### **Ames Laboratory**

Ames Laboratory is an Energy Research (ER) laboratory in Ames, Iowa that conducts basic and applied research in the preparation, characterization, and evaluation of properties of metals and their alloys, especially rare earth metals. Ames Laboratory also performs materials research, high-performance computing, and environmental research. It seeks solutions to energy-related problems through the exploration of physics, chemistry, engineering, applied mathematics, and materials sciences.

### **Argonne National Laboratory-East**

Argonne National Laboratory-East, in Argonne, Illinois, is an ER multidisciplinary research and development laboratory that conducts basic and applied research to support the development of energy-related technologies. Energy-related research projects include advanced reactor development, safety studies for light-water reactors, developing components and materials for fission and fusion reactors, superconductivity research, improvements in coal power, synchrotron radiation sources, and waste heat utilization. Further research includes medical radioisotope technology, environmental research, genetics research, materials engineering, ceramics, carcinogenesis, and the biological effects of ionizing radiation. Argonne-East is the home for the Advanced Photon Source facility which provides experimenting capability for industry, government, and academic scientists to explore photons and their link to advances in pharmaceuticals, adhesives, food processing, and many other applications.

### **Argonne National Laboratory-West**

The current mission for Argonne National Laboratory-West, located west of Idaho Falls, Idaho, includes technology development for spent nuclear fuel and radioactive waste treatment, reactor and fuel cycle safety, and closure of the Integral Fast Reactor Program. These activities are administered through the Office of Nuclear Energy (NE).

### **Brookhaven National Laboratory**

Brookhaven National Laboratory is an ER facility in Long Island, New York, whose current mission is to conduct fundamental research, including conception, design, construction, and operation of large complex research facilities. These facilities are used for both basic and applied research in high energy and nuclear physics; in basic energy sciences emphasizing fundamental research on biological, chemical, and physical phenomena underlying energy-related transfer, conversion and storage systems; and in the life sciences, and nuclear medical applications of nuclear techniques.

### **Environmental Measurement Laboratory**

Also in New York, the Environmental Measurement Laboratory is a government owned-government operated analytical laboratory which provides technical support to the Environmental Management Program and other federal agencies in the site characterization program; site closure initiative; world-wide monitoring program; non-proliferation/nuclear treaty initiative; and near-background levels of radiological/non-radiological development and validation.

### **Fermi National Accelerator Laboratory**

Fermi National Accelerator Laboratory, located in Batavia, Illinois, is an ER facility whose mission is to conduct research in high-energy physics. High-energy physics explores the fundamental structure of matter using high energy particle accelerators. Fermilab operates the Tevatron, which is the world's highest energy particle accelerator.

### **New Brunswick Laboratory**

New Brunswick Laboratory, located on the Argonne site in Illinois, is government owned-government operated. The Lab's mission is to serve as the U.S. Government's certifying authority for nuclear reference materials and provides an independent Federal technical staff and laboratory resource performing nuclear material measurements, safeguards and non-proliferation functions in support of multiple program sponsors.

## **Site Summaries (continued)**

### **Princeton Plasma Physics Laboratory**

Princeton Plasma Physics Laboratory in Princeton, New Jersey, is a single purpose ER laboratory focusing on research and development for fusion energy programs. The Laboratory is engaged in a broad spectrum of plasma physics research ranging from the theoretical analysis and modeling of fusion plasmas to the laboratory testing of plasmas approaching the conditions necessary for an energy producing fusion reactor.

### **Piqua Nuclear Power Facility**

The Piqua Nuclear Power Facility, located north of Dayton in the town of Piqua, Ohio, was dismantled and decommissioned between 1967 and 1969. The Piqua Nuclear Power Facility is currently undergoing surveillance and maintenance activities under the purview of the CH Environmental Management Program.

### **Hallam Nuclear Power Facility**

The Hallam Nuclear Power Facility is located on a small portion of the 640-acre site of the present Sheldon Power Station, owned by the Nebraska Public Power District. The entombed reactor is located slightly southeast of the center of the site. The Hallam Nuclear Power Facility has no current mission. Activities at the site are limited to semi-annual surveillance and maintenance.

### **Site A/Plot M**

Site A/Plot M is the former site of early activities by the Manhattan Engineer District between 1942 and 1956. Site A/Plot M is located within the Palos Forest Preserve in Cook County, Illinois and is owned by the Forest Preserve District of Cook County. Site A contained two experimental nuclear reactors and associated research laboratories. Plot M was used for the burial of radioactive waste from experimental research at Site A. Initial work involved research and the development of radioisotopes and fission products for uses in defense and non-defense activities. Removals of radiological hot spots and soils contaminated with heavy metals were completed in October 1996. Site A/Plot M is currently undergoing monitoring of groundwater, soil and air to affirm that there is no significant spread of contamination. Surveillance and maintenance activities have been on-going at Plot M since 1973 and expanded to include 17 new wells at Site A.

## **CH Environmental Management Vision**

The vision of the CH's Environmental Management Program is to complete cleanup at its sites by 2006. CH will do so while protecting the environment, human health, and worker safety through risk reduction and compliance with federal, state and local statutes. CH will work towards producing tangible results with consensus from stakeholders while ensuring that there is responsible management of public funds.

## **Changes From July 1996 “Ten Year Plan”**

The framework for the 2006 Plan, originally named “The Ten Year Plan”, and some its key assumptions have changed since developing the July 1996 documents. The most significant changes are:

- The actual funding received in Fiscal Year 1997 and the Fiscal Year 1998 funding allocation as submitted to Congress are used in both funding cases. These fundings represent reductions from previous planning documents. These reductions have extended schedules at Argonne-East and Brookhaven National Laboratories. While both sites are still planned to be completed by 2006, the pace of clean up is fiscally constrained.
- Two separate funding scenarios are addressed for the years Fiscal Year 1999 to Fiscal Year 2006, a low funding case (\$5.5B) and an high funding case. The low funding case is based on a approximately four percent reduction from the Fiscal Year 1998 funding. The high funding case is presented to document what is required to complete the program mission in an efficient and cost effective manner.
- With the reduced fundings, efficiency targets are being established. Specific goals include lowering contractor support costs to 30 percent and reductions in direct costs of 3.5 percent per year for all Environmental Restoration activities and 6 percent for all Waste Operations activities.

## **CH Waste Management Program**

The CH Waste Management Program is designed to ensure the minimization, safe handling, and disposal of waste generated at its sites. The Waste Management Program provides a support function to generators of waste at each of the CH research laboratory sites. This function includes: collection, treatment, storage and disposal of waste, program implementation, program development for waste generation avoidance, and facility management of treatment and storage facilities. Currently, CH plans to deal with its legacy (historical) waste through on-site treatment, treatment at DOE and commercial facilities, and disposal at other DOE sites. Much of this legacy waste has already been treated and/or removed from the CH sites.

A DOE Waste Management Alternatives Working Group was formed in 1995 to recommend alternatives to reduce costs and increase efficiencies, reconfigure responsibilities to promote waste generator accountability, and implement controls to reduce waste quantities (both newly generated and legacy). Based on the results of this study a preliminary decision has been made to transfer all waste operations activities to their respective landlord program sponsors. Agreement has been reached between Environmental Management, Energy Research, and Nuclear Energy to pilot this transition. Fermi and Argonne National Laboratory-W will be transferred to Energy Research and Nuclear Energy, respectively in Fiscal Year 1998. The transfer at Argonne National Laboratory-West will include responsibility for the remote handled sodium contaminated TRU waste. Final agreement on the timing and the funding reallocations for the remaining sites have not been made.

## **CH Waste Management Program (continued)**

The assumptions made for this Discussion Draft are that the transfer will be completed at the beginning of Fiscal Year 2000 and that funds allocated by Environmental Management for waste management activities will be transferred to the appropriate landlord program at that time. There will be no CH waste operations activities after Fiscal Year 2000 that are funded by the Environmental Management Program.

## **Environmental Restoration Program**

The Chicago Environmental Management Discussion Draft focuses on Environmental Restoration interim and end states with proposed site completions. The Discussion Draft utilizes a “Clean Labs” strategy which demonstrates technology applications, aggressive interim actions, accelerates schedule completions, maximizes near-term site completions, optimizes work sequencing and achieves cost savings while restoring seven sites for beneficial reuse by 2006. These sites include Site A, Ames Laboratory, Argonne National Laboratory East and West, Brookhaven National Laboratory, Princeton Plasma Physics Laboratory--Site C/D and Princeton University-Site A/B. The schedule of Environmental Restoration Site completions are attached for both funding scenarios.

This Discussion Draft benefits the Department in several ways.

- Multiple small release sites are environmentally restored for seven sites.

- DOE owned sites are more quickly available for reuse. The safety of the environment is restored thereby ensuring protection of the public at sites located in densely populated areas.

- Cost savings are achieved.

- Federal employees are available for other work.

- Non DOE owned sites are returned to private owners.

By 2006, all sites will have been completed with the exception of some residual pump and treat activities at DOE's Brookhaven National Laboratory. Surveillance and maintenance activities at Hallam, Piqua and Site A will be transferred to the Grand Junction Project Office.

## **Chicago Environmental Restoration Strategy**

The CH Discussion Draft feasibility is based on a clearly stated vision, stakeholder input, and well defined end states which are consistent with future use planning at the Chicago sites. A broad range of contracting strategies to achieve success are being implemented. These include performance based management contracts, alliances with industrial partners and competitive fixed price contracting. The Chicago ER program has successfully utilized these and other innovative contracting mechanisms to achieve high levels of cost and schedule performance in the past.

## **Chicago Environmental Restoration Strategy (continued)**

The overall strategy for the low funding case revolves around completing our smaller sites early, shortening the schedule for Brookhaven National Laboratory, and sequencing and optimizing restoration activities at Argonne National Laboratory-East. The Discussion Draft addresses higher risk activities first while making effective use of funding.

Reengineering efforts have been completed at Brookhaven National Laboratory and Argonne National Laboratory-East to achieve the 2006 vision. The reengineering effort at Argonne National Laboratory-East identified an approximately \$100 million savings due to risk based end states, more competition for work assignments, and reduced environmental uncertainty.

The constraints of the low funding case force the Argonne National Laboratory-East schedule for this optimized program to be stretched so that completion does not occur until the end of Fiscal Year 2006. The high funding case allows for a more expeditious schedule completing the roughly \$60 million program by the end of Fiscal Year 2001. Charts that illustrate the differences between the cases are attached. Likewise, the low funding cases delays the Brookhaven National Laboratory clean up schedule by two years as indicated on the following page.

## **Performance Enhancement**

As discussed in previous sections, the CH Discussion Draft is already developed with a number of performance enhancement initiatives that are in place. These include the following:

- Maintaining a CH Support Cost Rate that is already under the 30 percent level, which is identified as a goal in the Discussion Draft.
- Implementing the Accelerated Management Cleanup Strategies at all CH sites
- Utilizing Technology Applications
- Implementing Cost Saving Strategies identified through Benchmarking and other initiatives

These initiatives will continue to be implemented as part of the on going efforts. It is the specific goal of the Chicago Operations Office to be the first DOE Field Office to complete its EM Mission.

## **Compliance with Legal Requirements**

In both the CH Restoration and Waste Management Programs, compliance with environmental regulations will be maintained under either funding scenario. This includes meeting milestones established in Compliance Agreements, and meeting Federal, State, and Local environmental and legal requirements. Additionally, the Discussion Draft allows for the disposal of newly generated Radioactive Low Level Waste (LLW) to avoid storing this waste for disposal at a future date. To maintain compliance with regulations, funding reductions will first be achieved by storing LLW and by delaying Decontamination and Decommissioning activities which are not compliance driven.

## **Public Involvement in the Discussion Draft**

DOE and EM clearly recognize the need to work with regulators and stakeholders in developing the Discussion Draft 2006. A 90 day public comment period will immediately follow the release of the Discussion Draft. As part of this effort, Chicago Operations is very interested in working with regulators and stakeholders with the goal of making decisions that reflect public concerns and priorities. As such, we are very interested in receiving your thoughts and ideas on the CH Discussion Draft. To facilitate this discussion, a copy of the CH Discussion Draft is available for review at the information repositories listed on the attached page. The comment period will end on September 9, 1997. Please send your comments on the Chicago Discussion Draft to:

Mary Jo Acke  
Public Participation Coordinator  
U.S. Department of Energy  
Chicago Operation Office  
9800 South Cass Ave  
Argonne, IL 60439

In addition, workshops may be held on the Discussion Draft if interest is expressed by stakeholders. Information on the date, time and location of these meetings will be provided in separate mailings. If you have any questions, would like to learn more about the Discussion Draft, or want a presentation on the Discussion Draft made to your group or organization, please call Mary Jo Acke at (630) 252-8796.

Comments on the National Discussion Draft can be submitted to:

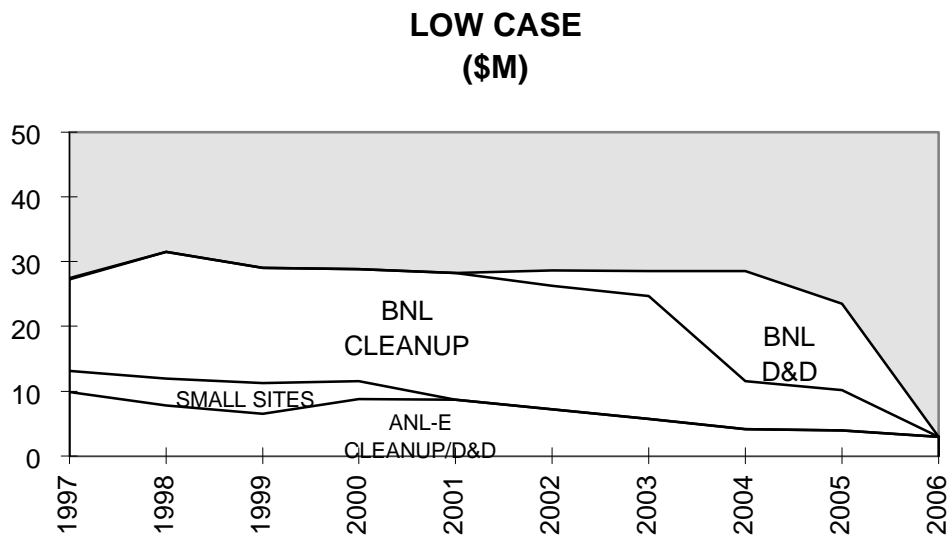
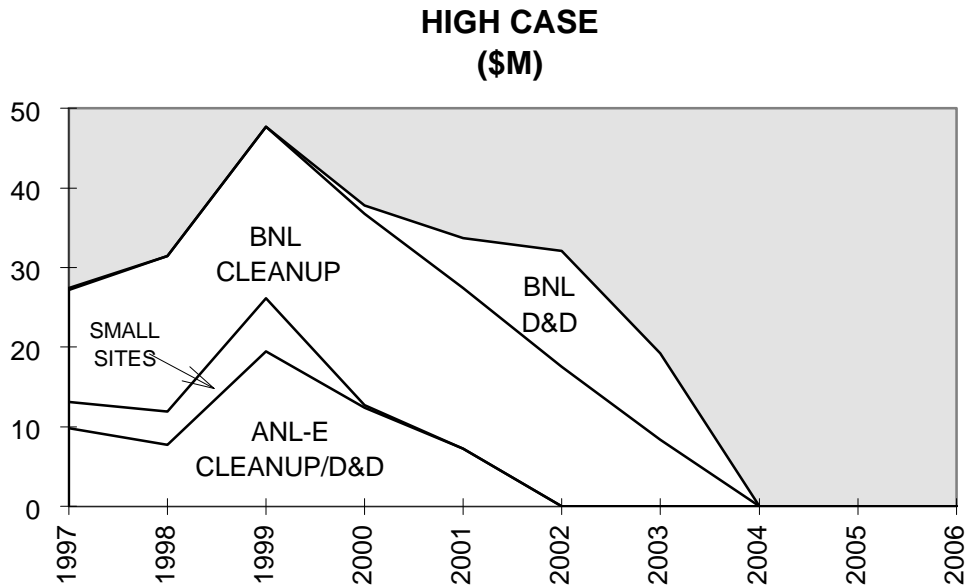
U.S. Department of Energy  
Mr. Gene Schmitt  
P.O. Box 44818  
Washington, D.C. 20026-4481  
E-Mail address: FocusOn2006@EM.DOE.GOV (not case sensitive)  
Call (800) 736-3282 to request a copy of the Discussion Draft

EM in parallel effort has asked sites to involve stakeholders in the formulation of the FY99 budget. The EM FY99 budget is being developed concurrently with the Discussion Draft. In July, EM will be holding a national feedback session to discuss the EM national FY99 budget. The options and alternatives described in the discussion draft and future iterations of the 2006 Plan will impact budget formulation and execution activities. This planning process will allow EM to develop annual budgets in the context of long term objectives.

Additional sources of information about the U.S. Department of Energy, the Environmental Management Program and the Discussion Draft may be obtained by visiting the DOE Website at [www.em.doe.gov](http://www.em.doe.gov) or by calling The Center for Environmental Management at 1-800-736-3282.



# CHICAGO OPERATIONS OFFICE FUNDING FOR ENVIRONMENTAL RESTORATION ACTIVITIES



# Chicago Operations Office

## Information Repository Locations

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### All Chicago Sites

University Library  
Documents Department  
The University of Illinois at Chicago  
801 South Morgan Street - 3rd Floor, Center  
Chicago, IL 60680  
312/996-2738

#### Mailing Address

Documents Department  
University Library  
P.O. Box 8198  
University of Illinois at Chicago  
Chicago, IL 60680

### Ames Laboratory

Ames Public Library  
Reference Section  
515 Douglas Avenue  
Ames, IA 50010  
515/239-5645

### Argonne National Laboratory

Lemont Public Library  
1136 State Street (temporary address)  
Lemont, IL 60439  
630/257-6541

Indian Prairie Public Library  
Reference Section  
401 Plainfield Road  
Darien, IL 60561  
630/887-8760

### Brookhaven National Laboratory

Longwood Public Library  
Reference Department  
800 Middle County Road  
Middle Island, NY 11953  
516/924-6400

U.S. EPA Records Center  
290 Broadway  
New York, NY 10007-1866  
212/637-4296

Brookhaven National Laboratory  
Research Library - Building 477A  
Upton, NY 11973  
516/282-3489

Mastics-Moriches-Shirley Community Library  
425 William Floyd Parkway  
Shirley, NY 11967  
516/399-1511

### Princeton Plasma Physics Laboratory

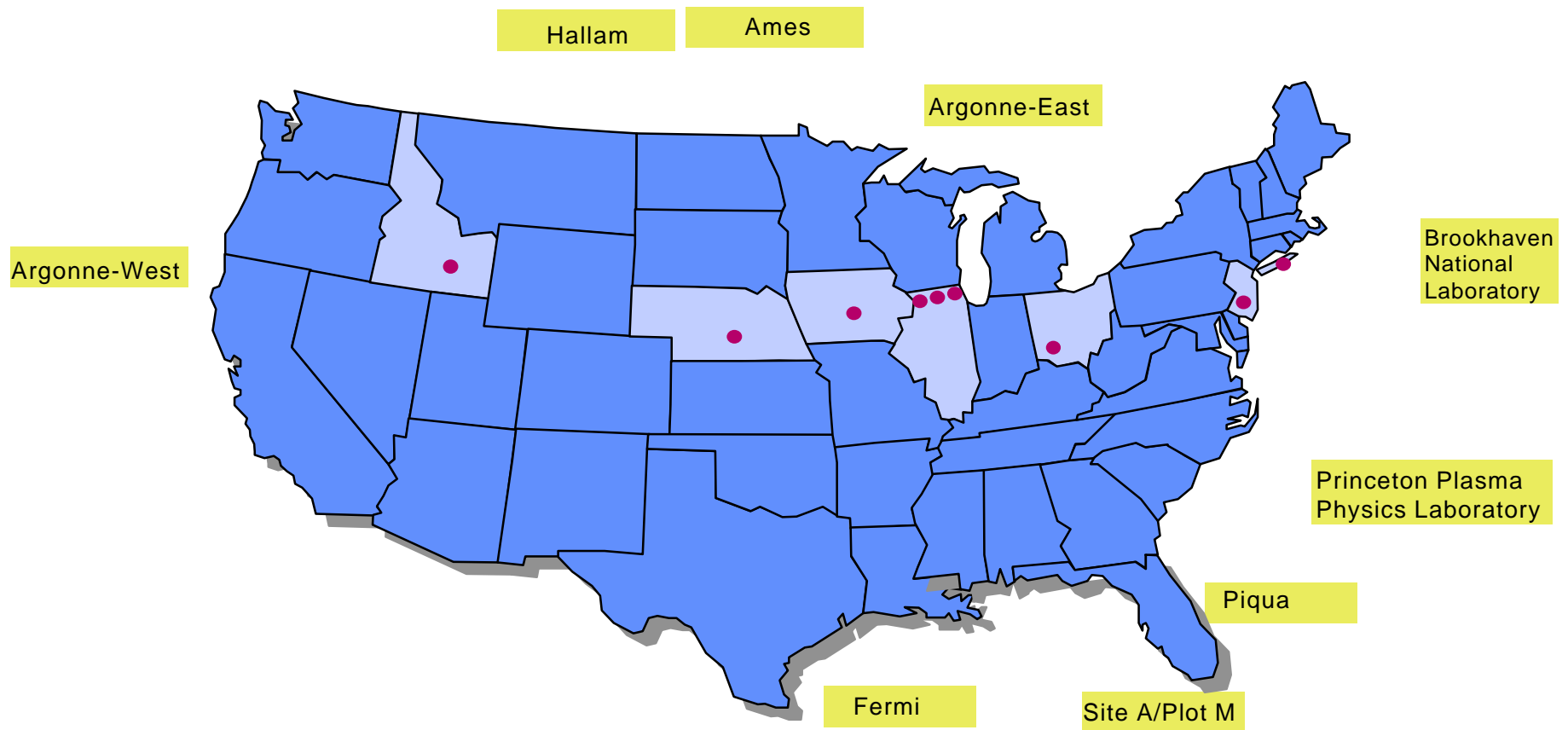
Middlesex County Library  
Plainsboro Branch  
Plainsboro, NJ 08536  
609/275-2897

### Site A/Plot M

Bedford Park Public Library  
7816 West 65<sup>th</sup> Place  
Bedford Park, IL 60510  
708/458-6826

Bridgeview Public Library  
7840 West 79<sup>th</sup> Place  
Bridgeview, IL 60455  
708/458-2880

# Chicago Operations Office Environmental Management Office



## **Introduction**

### **Chicago Operations Office's Environmental Management Vision**

The vision of the Chicago Operations Office's (CH) Environmental Management (EM) Program is to complete cleanup at its sites within ten years. To achieve this vision, the CH EM Program will be guided by the following principles:

- Protect worker health and safety
- Eliminate the most urgent risks
- Reduce the mortgage and support costs
- Reduce the generation of waste
- Create a collaborative relationship between DOE and its regulators and stakeholders
- Focus technology development on cost and risk reduction
- Integrate waste treatment and disposal across sites

### **CH EM Planning Purpose**

The Plan is designed as an executive document to be used to describe creative approaches to cleanup, to determine which waste streams, if any, will not be completed within the ten year period, and to decide how to treat them until all work is completed. This plan will guide Departmental strategic planning and CH decision-making during the next ten years.

The Plan acts as a major information resource for DOE's Headquarters Program Offices and CH to assist with the decisions concerning work scope and schedule as related to critical strategic and funding issues. Information included in this plan will guide CH EM with decisions concerning Chicago's Environmental Management Program related to release site planning, prioritization and other issues. The Plan provides information on site missions, the relationship of Environmental Management to the Office of Energy Research ("the landlord"), waste management activities, environmental restoration activities and their sequence, site strategies for assessment and remediation, future land use, and cost, schedule and scope.

### **Changes From Initial Plan**

The framework for the plan and some of the key assumptions utilized in developing the initial Plan have change. The most significant changes are:

- The actual budget received in FY1997 and the FY1998 budget allocation as submitted to Congress are used in both budget cases. These budgets represent reductions from previous planning documents.
- Two separate budget scenarios are addressed for the years FY1999 to FY2006, a low budget case and an "optimal" budget case. The low budget case is based on a approximately four percent reduction from the FY1998 budget. The second "optimal" budget case is presented to document what is required to complete the program mission.
- With the reduced budgets, efficiency targets are being established. Specific goals include lowering contractor support costs to 30% and reductions in direct costs of 3.5% per year for all Environmental Restoration activities and 6% for all Waste Operations activities.

### **Changes From Initial Plan** (Continued)

- The framework for the plan has also changed. The basic building blocks for this plan are Project Baseline Summaries (PBSs). All activities have been projectized into PBSs. This was accomplished by identifying an individual or group of similar and/or associated activities that have a defined scope, schedule, and cost supporting a defined end state.

### **Relationship to Baseline Environmental Management Report (BEMR)**

While BEMR data was considered during the formation of cost and volume data described in this plan, cost, volumes and schedule data has been adjusted to correspond with the assumptions described in a following section. The BEMR analyzes costs over a 70 year period. It includes ongoing costs for surveillance and maintenance, groundwater pump and treat projects, and certain costs for treatment and disposal of transuranic wastes that will be incurred after the ten year period. The BEMR also does not take into account potential efficiencies from consolidated treatment and disposal or cost savings resulting from accelerating cleanup schedules. Modeling of the CH information for the BEMR submission also contributes to substantial differences from the data reflected in this plan. These differences are further explained in the attached BEMR/Plan comparative analysis.

### **Relationship to Other Environmental Plans**

The Plan assumes a ten year time frame for completion of the CH EM program and a level of funding that differs by site from that reflected in the Environmental Restoration (ER) Management Action Plan. Current CH Environmental Restoration baselines are being modified to reflect the accelerated schedule described in this plan. As such, the Environmental Restoration costs reflected in this plan have not been validated, except where noted. The WM data enclosed is consistent with data in the draft WM Program Baseline and current year work plans (CYWPs). Other CH EM documents are being revised to support this CH EM Plan. Accomplishment of accelerated cleanups within the next ten years requires significant re-engineering of work scope and schedule for the Brookhaven National Laboratory and Argonne National Laboratory-East Environmental Restoration Programs. Rebaselining of both of the programs is currently underway in an effort to meet the goal of the CH EM Plan by maximizing near term completion's and optimizing work sequencing.

### **Chicago Environmental Management Program**

The mission of the Chicago Operations Office's Environmental Management Program is to protect the environment, human health, and worker safety through risk reduction, compliance with all federal, state and local statutes; focusing on tangible results, building consensus with regulators and other stakeholders; and responsibly managing public funds. The Chicago Environmental Management Program's goal is to complete cleanup at most sites within 10 years, with a few sites requiring surveillance and maintenance. Waste management (WM) activities will be returned to the landlord, the Offices of Energy Research and Nuclear Energy, for most CH sites, over a phased period, completing the process by the beginning of FY2000. Waste management programs at two CH sites will be transferred to their respective landlords in FY1998 and are therefore only addressed in this plan for activities in FY1997. These sites are Fermi National Accelerator Laboratory and Argonne National Laboratory-West.

## **Introduction** (Continued)

### **Chicago Environmental Management Program** (Continued)

Planned future use for the majority of the Chicago environmental restoration sites is the return of the sites to the Office of Energy Research. Some of the smaller sites are expected to be returned for unrestricted use. A few CH sites are anticipated to be transferred to the Grand Junction Project Office for long term surveillance and maintenance activities.

## **Plan Scope**

### **Program End State**

The end state of the CH EM program at the completion of the Plan will be:

- All waste operations activities at CH sites have been transferred to the landlord program. This transfer will be completed by FY 2000. All currently defined legacy waste will be disposed.
- Environmental Restoration activities at CH M&O sites are complete within the definition of “complete cleanup” provided in the guidance. Residual pump and treat activities, as well as any necessary surveillance and maintenance activities, have been transferred to the landlord program, as part of its site-wide environmental compliance program.
- All long term CH surveillance and maintenance activities at non-M&O sites (Site A, Piqua and Hallam) will be transferred to the Grand Junction Project Office by FY 1998.
- No new facilities have been accepted into the EM program.
- The scope of work within this Plan is the same for both budget cases. The schedule and cost however are significantly different. These differences are discussed in the PBSs.

### **Budget**

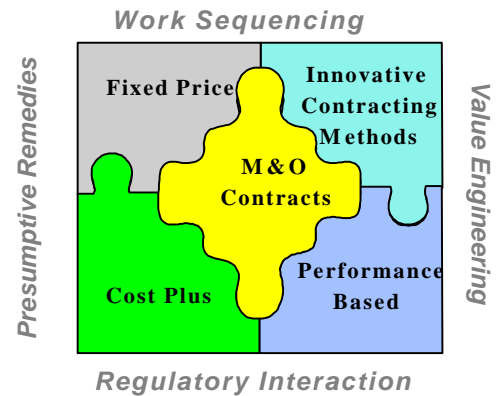
- This Plan addresses two budget cases. Both cases are constrained in FY1997 and FY1998. The FY1997 budget is based on the funds received. The FY1998 budget is based on EM’s budget request to congress. The FY1998 budget was then allocated by program (Environmental Restoration and Waste Management) and by site utilizing the CH prioritization system. Implementation of the FY1998 CH program based on these allocations may involve reprogramming of funds. The FY1997 and FY1998 budgets presented in this plan are significantly reduced from previous planning documents. With the reduced budgets, efficiency targets are being established. Specific goals include lowering support costs to 30% and reductions in direct costs of 3.5% per year for all Environmental Restoration activities and 6.0% for all Waste Operations activities.

### Cross Site Issues

In order to resolve several remaining issues concerning the CH Environmental Program and complete the scope of the Plan within the allotted time frame, cooperation and facilitation by other Operations Offices is required.

#### Contracting Strategies

- Performance Based M&O Contracts
- Competitive Fixed Price Subcontracts
- Interagency Agreement with COE
- Direct DOE Oversight of Field Contractors
- Alliances w/Industrial Partners for Technologies
- Novate Subcontracts to DOE/CH



Reengineering efforts have been completed at BNL and ANL-E to achieve the vision. The reengineering effort at ANL-E identified an approximately \$100 Million savings due to renegotiation with regulators, introduction of competition into program estimation, and reduced uncertainty. The constraints of the low budget case force this optimized program to be stretched so that completion does not occur until the end of FY2006. The “optimal” budget case allows for a more expeditious schedule completing the roughly \$60 Million program in five years by the end of FY2001.

### Past Accomplishments

The Chicago Environmental Restoration Program has a excellent track record of implementing a small site strategy at sites including Ames Laboratory, Site A, Battelle Columbus Laboratory and at Reactive Metals, Inc. This optimized plan is realistically feasible due to the fact that the considered sites have few technology or regulator issues. Chicago also makes use of federal cost estimators (Corps of Engineers) to augment Chicago expertise and achieve additional cost savings.

In FY 1995, the Chicago ER program met or exceeded all Environmental Management expectations in such areas as risk reduction, health and safety, technology development, stakeholder involvement, the use of alternative contracting strategies and financial responsibility. All FY 1996 performance measures have been met. Chicago was able to exceed its commitment regarding interim actions through improved project management; reduction in environmental restoration carryover; achievement of an uncosted balance of \$530,000; and exceeding the EM cost savings commitment. The Chicago ER Program has also been able to establish a low direct to support cost ratio.

## Plan Scope (Continued)

### Past Accomplishments (Continued)

This track record demonstrates that the Chicago ER program can effectively achieve its programmatic goals while managing large changes in the financial aspects of the program. Chicago has also effectively managed risk and regulatory issues through active communication with regulators.

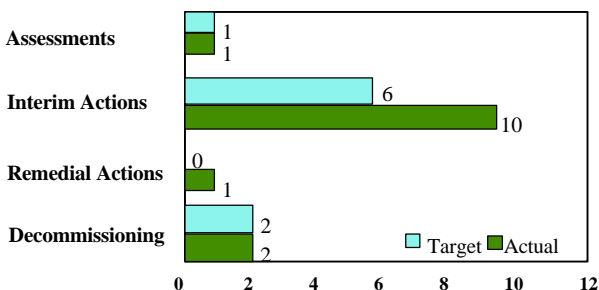
### CH Track Record

#### FY 95 Report Card

##### Met or Exceeded all Expectations

- Risk Reduction
- Health & Safety
- Fiscal Responsibility
- Tangible Results
- Technology Development
- Stakeholder Involvement
- Alternative Management Strategies

#### FY1995 Performance Measures



#### Balance Sheet

Prior Year (FY94) Carryover	\$13,415K
FY1995 Budget Authority	54,044K
Total Funds Available	67,459K
FY1995 Costs	66,929K
FY1995 Uncosted Obligations	530K
Carryover Reduction (94-95)	96%
% Carryover (end of 1995)	.008%

### Summary of Proposed Activities

#### Site A

Removal of radiological “hot spots” and heavy metal contaminated soils has been completed at Site A. Site transfer to private landowner, the Forest Preserve will run in the Spring of 1997. This completes ten release sites.

#### Princeton Plasma Physics Laboratory

PPPL activities at Site C/D include the completion of two small soil removals and completion of a supplemental ground water investigation. PPPL has worked with its regulators to develop realistic expectations thereby lending itself to acceleration. For an investment of \$1.5 million dollars, the current schedule will be reduced by 11 years, 7 release sites will be completed with a corresponding cost savings of \$5.8 million as measured from the revised baseline.



## **Plan Scope** (Continued)

### **Summary of Proposed Activities** (Continued)

#### **Argonne National Laboratory-West**

The Plan schedule brings all environmental restoration activities into a five year window for completion. These activities include soil excavation and a decontamination and decommissioning project, which complete one Waste Acceptance Group of Idaho National Engineering Laboratory's Federal Facilities Compliance commitments. The project's scope is well defined. Thirty-eight (38) release sites/facilities will be completed, shortening the baseline schedule by two years and reducing project costs by \$2.6 million.

#### **Princeton University-Site A/B**

The accelerated schedule completes the release site and more importantly achieves the objective of negotiating the Department's percent of liability from past activities at the site.

#### **Argonne National Laboratory-East**

The ANL-E site is prepared to execute an optimized schedule. Project scope is well defined. The implementation of the CH Plan low case defers work during the FY1999 to FY2001 time frame in order to complete efforts at BNL, PPPL, Ames, and ANL-W. Under this scenario ANL-E site completion is at the end of FY2006. The higher "optimal" case budget allows for site completion occurring in FY2001. One hundred and five (105) individual release sites/facilities will be completed.

#### **Brookhaven National Laboratory**

The Brookhaven National Laboratory is currently developing a plan to accelerate the selection and implementation of remedial activities within seven years. The plan will integrate the development and approval process for all Records of Decisions within the next two years. The evaluation of alternatives and the selection process will be developed interactively with involvement of political and regulatory interests as well as stakeholders and public interest groups. The accelerated schedule will include the activities required to plan and implement the decontamination and decommissioning of the Brookhaven Graphite Research Reactor. The schedule will incorporate the use of innovative contracting mechanisms to obtain timely and cost-effective products and results.

### **Issues Affecting Environmental Restoration Projects**

One major issue for the Chicago Operations Office Environmental Management Program is the future for the Princeton Plasma Physics Laboratory and the Argonne National Laboratory-West sites. Reductions in operating programs at these sites may make them site-wide clean-up programs in the relative near future. Cost, schedule and scope data for these potential clean-up programs at PPPL and ANL-W are not included in this Plan.

Another major issue is the amount of funding for the relatively small CH programs. Each time an “across the board” cut is made for all operations offices, the impact is more significant than at the larger sites.

Several minor issues may impact the ability of the Chicago Environmental Restoration program to complete projects in a timely and cost effective manner. Including:

- Unresolved Environmental Restoration scope at a site;
- Limited disposal options for waste streams which impair reliability and raise project costs;
- Reduction in funds threatens the ability to maintain work in progress, constrains new activities, and may impact cooperative program funding for large scale technology demonstrations;
- Baseline deficient funding may increase the possibility of:
  - increasing risk
  - increasing potential contamination migration
  - increasing total cost
  - raising stakeholder concerns
  - lengthening overall completion schedule
  - compromising overall schedule completion's.

Because of these issues the high “optimal” budget case was developed to allow CH to request the funding that is required to successfully complete the program mission.

### **Relative Risk Assessment**

The relative risks of the Chicago Environmental Restoration Program were ranked by Risk Data Sheet using a process developed by the FY 1998 ADS/RDS team and reviewed by a peer group of Environmental Management staff. Risk data were evaluated and ranked based on such factors as impact to the public, site personnel, the environment, compliance, mission, mortgage reduction and social and cultural factors. There were no major comments to the CH relative risk assessment made by the peer review process. This risk assessment was re-evaluated and summarized at the PBS level for this plan. In addition a FY1999 prioritized activity list is attached which was developed utilizing the risk assessment as input.

### **CH Waste Management Program and Return to Landlord Process**

The mission of the Chicago Operations Office's (CH) Environmental Management Program is to protect the environment, human health, and worker safety through risk reduction and compliance with federal, state and local statutes, and to produce tangible results with consensus from stakeholders while ensuring the responsible management of public funds. The CH Waste Management Program is designed to ensure the minimization, safe handling, and disposal of waste generated at its sites. The Waste Management Program provides a support function to generators of waste at each of the CH research laboratory sites. This function includes: collection, treatment, storage and disposal of waste, program implementation, program development for waste generation avoidance, and facility management of treatment and storage facilities.

A Waste Management Alternatives Working Group was formed in 1995. The group was tasked by the Office of Waste Management to recommend alternatives to recalibrate the structure of the waste management program to reduce costs and increase efficiencies, reconfigure responsibilities to promote waste generator accountability, and implement controls to reduce waste quantities (both newly generated and legacy). Based on the results of this study a preliminary decision has been made to transfer all waste operations activities to the landlord programs at all CH sites. Agreement has been reached between EM, Energy Research, and Nuclear Energy to pilot this transition. FNAL and ANL-W will be transfer to Energy Research and Nuclear Energy, respectively in FY1998. The transfer at ANL-W will include responsibility for future treatment of the remote handled sodium contaminated TRU waste. Final agreement on the timing and the funding reallocations for the remaining sites have not been made. The assumptions made for this Plan are that the transfer will be completed at the beginning of FY 2000 and that funds allocated by EM for waste management activities will be transferred to the appropriate landlord program at that time. There will be no CH EM-managed waste operations activities after FY 2000.

In the interim, CH EM is pursuing initiatives designed to reduce and contain costs, and to enhance the productivity of waste management activities. Examples of these initiatives include the establishment of waste minimization goals; privatization or out-sourcing of waste functions; activity-based costing analysis of waste operations; bench-marking; value engineering; performance-based contracting; preliminary "necessary and sufficient" type approaches to waste management drivers; risk-based release limits and so forth. Many of these activities will lead to a lowering of waste management costs. These efforts need to be a part of the overall recalibration plan for waste management and should be implemented regardless of which program is funding it. Additionally, much of the resources currently budgeted for waste management are ultimately directed toward "support" and indirect cost functions, rather than program-direct costs for actual storage, treatment, and disposal of wastes. Some resources represent site-specific support (such as training, preparing Environmental Impact Statements, etc.), but some funding is also necessary to interact with DOE Headquarters, Regulators, and the public on a myriad of different initiatives. Improving the efficiency with which the waste management mission is conducted includes optimization of these support and indirect functions. Therefore, initiatives to address both mission-specific and support functions are being formulated by CH.

Further descriptions of site activities are included in Appendix I.

## **National Program Needs**

No information under this sub topic.

## **Technology Development**

Technology development needs are discussed in the Operations/Field Office Baseline Summary attached to this plan.

## **Environmental Measurement Laboratory**

The Environmental Measurement Laboratory (EML), located in New York, is a government owned-government operated analytical laboratory which provides technical support to the EM Program in the following areas:

- Site Characterization Initiative
  - Quality Assurance
  - Planning and Data Assessment
  - Technical Assistance
  - Business Optimization
- Site Closure Initiative
  - Site Compliance
  - Designs/Conducts Final Surveys
  - Development of Guidance
  - Training/Demonstration of Advanced Technologies
- World-Wide Monitoring Program
- Non-Proliferation/Nuclear Treaty Initiative
  - Scientific Leadership
  - Automatic Radioactive Aerosol Monitors
  - Quality Assurance Plan for IAEA
  - Radiological Characterization of Former Soviet Union Nuclear Sites
- Near-Background Levels of Radiological/Non-Radiological Development and Validation

EML supports the integration of site characterization data through programs administered by EM-76, and other programs related to environmental restoration and waste management. EML provides scientific consultation at EM working group meetings, representation on international committees and membership on national and international standards committees. EML participates in the development of policy concerning decommissioning and release criteria of contaminated facilities in concert with the Nuclear Regulatory Commission or Defense Nuclear Facilities Safety Board guidelines. EML represents the Department of Energy in the support and implementation of U.S. policy on environmental measurements and quality assurance for the IAEA's Safeguards and Security Program and for nuclear treaty monitoring.

## Assumptions

### General

- No new EM facilities have been added .
- The plan is based on the current FY 1997 budget that has been received, the FY 1998 budget that has been submitted to Congress, and for FY 1999 to FY 2006 two funding cases are addressed. The low budget case is based on a flatlined budget calculated from a 4.35 percent reduction from the FY1998 budget. Further, inflation (assumed to be 3%) is included within the flatlined budget. The second “optimal” budget case is presented to document what is required to complete the program mission in an efficient and cost effective manner. Attached is the FY1999 program prioritized by sub-element.
- Management and financial responsibility of newly generated waste outside the EM Program will be assumed by the generator beginning in FY 1998 and phased in for all CH sites by FY 2000. FNAL and ANL-W have been transferred starting in FY1998, and as such, are only addressed in this plan for FY1997.
- Current unit cost charged for managing EM-40 waste will remain constant (landlord transfer of EM-30 activities will not affect cost).
- The EM-40 program described in the low case of this plan is based on the IRB FY 1998 Accelerated Case (BNL accelerated before ANL-E).
- The EM-40 S&M activities at Piqua, Hallam and Site A are transferred in FY 1998 to the Grand Junction Project Office.
- Ames S&M activities will be transferred to the landlord.
- All CH TRU waste will go to WIPP.

## Definitions

### Project

A project is defined as a set of related activities or functions that support a discrete end state or end product related to mission completion.

### Support Costs

#### General Support

These include executive direction, human resources, chief financial officer, procurement, legal, administrative support, lab-directed R&D, information services and information/outreach activities.

## **Definitions** (Continued)

### **Support Costs** (Continued)

#### **Mission Support**

These include environmental, safety and health, facilities management, maintenance, utilities, safeguards and security, logistics support, quality assurance, technical support and matrix management.

### **Completion**

#### **Assessment**

An assessment is considered complete when the characterization document is complete and a final response or no action decision is documented by DOE.

#### **Pump and Treat Projects**

These projects are considered complete when the treatment facility is operating.

### **Release Site**

A release site is defined as a unique location at which a hazardous, radioactive or mixed waste release has occurred or is suspected to have occurred. It is usually associated with an area where wastes or substances contaminated with wastes have been disposed of, treated, stored, and/or used. Under CERCLA, release sites include both source areas and areas of migration where hazardous substances have come to be located. A release site typically includes the actual geographic area covered by a source and the extent of associated contamination as delineated during the PA/SI and RL. It may include areas in close proximity to the contamination that are necessary for implementing a response action.

### **Facilities**

A facility is generally defined as a uniquely identifiable building or structure. Sometimes a facility is a room or part of a building or structure. Sometimes it is a group of buildings or structures. Only facilities that have been accepted into the Environmental Restoration program are listed.

## **Appendix I - Site Activities and Facility Descriptions**

### **Argonne National Laboratory - West**

#### **Introduction**

Argonne National Laboratory-West (ANL-W) is the most eastern of the Idaho National Engineering Laboratory facilities. It is located approximately 35 miles west of Idaho Falls, Idaho. ANL-W is operated by the University of Chicago under the guidance of the U.S. Department of Energy Chicago Operations Office, and supported by a local area office for interfacing with DOE-ID.

INEL is one of DOE's largest National Laboratories. Originally the competitively-selected site of U.S. Navy gunnery range, INEL later became the first place in the United States where nuclear reactors were built to test the idea of nuclear power as a commercial energy source. The 890-square-mile plain of high desert where INEL is located contains the largest concentration of nuclear reactors (52) in the world. Most of the reactors have been phased out after fulfilling their research mission, but several are still operating.

The INEL site consists of ten major facilities areas, each typically less than a few square miles in size and separated by miles of desert, where the engineering research and development projects are conducted. ANL-W administers an area that is slightly over one square mile and consists of 40 primary buildings and approximately 45 support buildings. Current land use is in support of the above facilities which support the primary mission of the laboratory. Further land use continues to be projected as industrial. No leased agricultural areas, disposal facilities, or production areas reside on the ANL-W administered property.

ANL-W has been at the Idaho site since the Site's inception as the National Reactor Testing Station (NRTS), where it originally built and operated the Experimental Breeder Reactor (EBR-1) facility. Construction began at the present ANL-W site in the mid-1950's, with the plant becoming operational in stages from 1959 through the mid-1960's. The ANL-W facility was constructed for the purpose of researching and developing liquid metal fast breeder reactor technology. In general, these activities consist of irradiating reactor fuels and structural materials, and conducting high-temperature nuclear experiment, reactor physics experiments, diagnostic inspections, and laboratory analyses.

The current mission of Argonne National Laboratory-West (ANL-W) is research and development in support of the nation's spent nuclear fuel program. The ANL-W complex includes the Experimental Breeder Reactor II (EBR-II), Fuel Conditioning Facility, Hot Fuel Examination Facility, Analytical Laboratory, Radioactive Scrap and Waste Facility, Sodium Process Facility, Radioactive Liquid Waste Treatment Facility, Fuel Manufacturing Facility, Zero Power Physics Reactor, and the Transient Reactor Test Facility. ANL-W operates these facilities as well as a variety of chemical storage, waste storage and disposal facilities, and office and maintenance facilities. Research activities require the use of numerous chemical and radioactive materials, resulting in the generation of a variety of hazardous, radioactive and mixed wastes. Waste operations encompass all non-production facility operations which include facilities used for the storage, treatment or disposal of radioactive, hazardous, mixed waste that have been properly characterized, packaged, and labeled. ANL-W also manages facilities that are used for long-term storage of radioactive and mixed waste.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - West** (Continued)

#### **Regulatory Drivers**

On December 21, 1989, the INEL, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), was added to the EPA's National Priorities List of Superfund site. On December 9, 1991, the INEL Federal Facility Agreement/Consent Order (FFA/CO) was signed and approved by the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Idaho Department of Health and Welfare (IDHW). The goal of this agreement is to ensure that releases or threatened releases of hazardous substances at the INEL are thoroughly investigated in accordance with the National Contingency Plan and that appropriate response actions are undertaken and completed as necessary to protect human health and the environment. The INEL must also comply with the Resource Conservation and Recovery Act (RCRA), which is administered by the State of Idaho under the authority of the Idaho Hazardous Waste Management Act (HWMA). RCRA regulates generation, transportation, treatment, storage, and disposal of hazardous wastes and corrective action of releases of hazardous waste to the environment.

The population within an 80-kilometer (50-mile) circle centered at ANL-W has been characterized for the purposes of identifying whether any disproportionately high and adverse impacts exist to minority and low-income communities. The population surrounding the INEL is 7 percent minority and 14 percent low income, based on U.S. Bureau of Census information.

The INEL has been broken into ten Waste Area Groups (WAG) for ease of management. WAG 9 is at ANL-W. ANL-W sites being investigated include tanks and wastewater handling/disposal systems such as ditches, ponds, pits, and drains. The boundary of WAG 9 is basically the ANL-W administrative boundary. WAG 9 includes all surface and subsurface areas described above. WAG 9 is broken into four operable units (OU). The OUs are known as OU-9-01, OU-9-02, OU-9-03 and OU-9-04.

#### **Environmental Restoration Activities**

The FFA/CO addresses the contamination of these four Operable Units. In the FFA/CO, the sites are listed as follows: 18 No action sites, 10 OU 9-01 sites, one OU 9-02 site, three OU 9-03 sites, and five OU 9-04 RI/FS sites. Decision Documentation Packages for the OU-1 sites, Preliminary Scoping Packages and Summary Reports for the OU-2 and OU-3 sites, and Preliminary Scoping Packages for the RI/FS sites have been completed and submitted to the EPA and IDS for review and comment.

On February 3-4, 1994 a WAG 9 scoping meeting was held at the ANL-W facility to discuss the scoping documents (OU 9-04 Preliminary Scoping Packages) that were submitted for review and to discuss the possibilities of accelerating the Comprehensive RI/FS. Those who attended this meeting were WAG 9 managers from EPA, EDHW, DOE-AAO, DOE-CH and ANL-W Environmental Remediation personnel. At this meeting, all of the remaining 19 FFA/CO sites were discussed and WAG 9 managers concerns/resolutions as well as recommendations for future spending, and methods for accelerating the FFA/CO process were discussed. ANL-W personnel have since conducted the pre-RI collection activities in OU 9-04 to fill the identified data gaps in order to complete the Comprehensive RI/FS in an accelerated manor.



## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - West** (Continued)

#### **Environmental Restoration Activities** (Continued)

At ANL-W, to date, 8 of the ten sites in OU-9-01 have received No Further Action Decisions. OU-9-02 contains one site, EBR-II Leach Pit (ANL-08). OU 9-03 contains three sites: Open Burn pits (ANL--05); Industrial Sanitary Waste List Station (ANL-31); and fuel Oil Spill by Building 755 (ANL-34). The three sites in OU 9-03 have received a No Further Action determination by DOE, EPA and IDHW.

The remaining two sites in OU-1, the one site in OU-2 and the five sites in OU 9-04 will be further evaluated during the Comprehensive RI/FS in FY 1997. The RI/FS is expected to consist of the installation of one monitoring well to groundwater, at a depth of 650 feet; a continuous core to groundwater in the EBR-II leach pit; a sitewide ecological risk assessment; and, a sitewide Comprehensive Baseline Risk Assessment. Also, three Removal Actions have been identified at the three sites to remove contaminated soils. The Removal Actions will be complete in FY 1997. FY 1998 activities include the signing of the Record of Decision and planning of any necessary Remedial Action activities for FY 1999. Closeout of activities is planned for FY 2000, with long term monitoring of wells to be performed as necessary.

#### **ANL-W Waste Management Activities**

Facilities at ANL-W regulated under the Resource Conservation and Recovery Act (RCRA) are currently permitted or are currently operating under an interim status RCRA permit. Currently, ANL-W is not required to have an established RCRA groundwater monitoring plan since it does not operate any land-based TSD facilities. If RCRA groundwater monitoring is deemed necessary at a later date, the required elements will be incorporated into this Plan as a future revision.

Routinely generated hazardous waste is collected from the generator and usually stored in a 90 day temporary storage area at ANL-W or at INEL. It is subsequently disposed of at an off-site permitted disposal facility.

Low level waste management operations are composed of the collection, treatment and storage of low level waste at ANL-W. Waste is shipped either to the Radioactive Waste Management Complex (RWMC) or to the Waste Experimental Reduction Facility, both at INEL with minimal costs to EM-30 at ANL-W. All low level radioactive liquid waste at ANL-W is processed through their Radioactive Liquid Waste Treatment Facility.

Mixed low level waste is kept within RCRA regulated areas at ANL-W and the INEL storage facility. The treatment and storage is delineated in the Site Treatment Plan as required under FFCA.

Some low level historical waste, mixed waste and recoverable nuclear materials are presently stored at the Radioactive Scrap and Waste Facility (RSWF) in accordance with the RSWF RCRA permit. The permit requires the continuous upgrade of the liners in which the waste is stored to prevent a potential release to the environment.

Routine shipments of TRU waste occur from ANL-W to the RWMC at INEL for storage and eventual disposal at WIPP. TRU waste contaminated with elemental sodium is moved to the RSWF.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - East**

#### **Introduction**

Argonne National Laboratory (ANL) had its inception in the World War II research activity, code named “The Metallurgical Laboratory”, at the University of Chicago. Under the leadership of Enrico Fermi, the Metallurgical Laboratory accomplished the initial development of nuclear reactor theory and, in December 1942, the first experimental demonstration of controlled nuclear chain reaction. The Metallurgical Laboratory also initiated and led the rapid development of the basic chemistry and nuclear physics of uranium, plutonium, and several new, man-made transuranic elements created in the first atomic pile.

After the end of World War II, in August 1945, a Federal decision was made to continue nuclear research, development, and production activities. The Argonne Division of the Metallurgical Laboratory became Argonne National Laboratory on July 1, 1946; in the same year, the Atomic Energy Act of 1946 established a civilian agency, the Atomic Energy Commission (AEC), to manage and control the atomic energy program. AEC assumed control of the program from the U.S. Army in January 1947.

The AEC broadly defined basic research as a major element of the ANL mission, a principle that carried over to other multiprogram national laboratories as they evolved or were created. Building on wartime strengths, the Laboratory rapidly developed strong basic research programs in nuclear and reactor physics, in fundamental nuclear and radioactive-element chemistry, and in the biology of radiation effects. Applied programs in support of reactor development included chemical engineering, metallurgy, reactor engineering, applied mathematics, and instrumentation. In 1948, the AEC assigned to ANL the principal responsibility for reactor development. While this assignment emphasized applied programs, related basic research also continued to grow in strength and scope.

The Metallurgical Laboratory at Chicago was originally housed in University and temporary buildings on or near the University of Chicago campus, except for reactor development activities, which were situated on leased land located southwest of the city, in the Cook County Forest Preserve. With the University and the Forest Preserve District pressing to regain use of their property, the AEC selected and acquired the ANL-East site in 1947. Temporary buildings were erected to house the rapidly expanding reactor development work as design and construction of permanent facilities and infrastructure proceeded. The first permanent buildings were completed in 1950, in the 200 Area, and virtually all ANL activities were accommodated on site by 1954.

Through the 1950s and early 1960s, specialized facilities were added in the 300 and 360 Areas of the site, as was Building 212 in the 200 Area of the site. This period of growth culminated in the Zero Gradient Synchrotron (ZGS) complex during the late 1960s and early 1970s.

The 1970s saw modest retrenchment in basic research, as Federal research and development budgets tightened. During this same period, engineering research and development extended into many fossil- and alternative-energy sources and systems as the limits on energy resources became a national concern. The expertise of ANL staff broadened into areas such as systems analysis, economics, and management science, to accommodate the growing federal need for wide-ranging analysis of technological developments.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - East** (Continued)

#### **Introduction** (Continued)

Environmental analysis and research also expanded as national concern for preservation of the natural environment became an important constraint on the development and deployment of energy technologies.

During the late 1970s and early 1980s, facilities at the laboratory actually contracted, despite the construction of several new permanent facilities in the 200 Area, including the Administration Building (201), Visitors Reception Center, and Electronics and Graphic Arts Facility, and Safeguards and Security in the 300 Area. This space reduction was achieved by the demolition of 65 substandard buildings and removal of 119 temporary trailers.

The late 1980s and early 1990s brought a renewed emphasis on construction. Dedication of a large portion of the 400 Area for the Advanced Photon Source (APS) and increased priority for environmental and safety functions have increased the need for appropriate facilities. Demolition and renewal of remaining substandard structures and their replacement by more efficient structures is also continuing; as does the need for maintenance and upgrades of existing permanent improvements to the site.

Argonne currently conducts work for nineteen DOE secretarial offices, several DOE contractors, another 20 Federal agencies, and more than 32 private, state, and international organizations. The major scientific program areas at the Laboratory are nuclear energy research and development, biological and environmental research, high energy and nuclear physics, and basic energy sciences (including materials science and computing). Increasing emphasis is being placed on world-class basic research user facilities, such as the Intense Pulsed Neutron Source (IPNS) and the Advanced Photon Source (APS).

Argonne National Laboratory (Illinois site) occupies the central 688 hectares (1,700 acres) of a 1,514-hectare (3,740-acre) tract in DuPage County. The site is 43 km (27 mi) southwest of downtown Chicago and 39 km (24 mi) west of Lake Michigan. It is north of the Des Plaines River Valley, south of Interstate Highway 55 (I-55) and west of Illinois Highway 83. The 826-hectare (2,040-acre) Waterfall Glen Forest Preserve surrounding the site is mostly former ANL property that was deeded to the DuPage County Forest Preserve District in 1973 for use as a public recreational area, nature preserve, and demonstration forest.

#### **Regulatory Drivers**

The Resource Conservation and Recovery Act (RCRA) and its implementing regulations are intended to insure that hazardous waste are disposed of in an environmentally safe manner and that facilities that treat, store, or dispose of hazardous waste do so in a way that protects human health and the environment. The Hazardous and Solid Waste Amendments of 1984 (HSWA) created a set of restrictions on land disposal of hazardous waste.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - East** (Continued)

#### **Regulatory Drivers** (Continued)

In addition, HSWA also requires that releases of hazardous waste or hazardous constituents from any solid waste management unit located on the site of a RCRA-permitted facility be cleaned up, regardless of when the waste was placed in the unit or if the unit was originally intended as a waste disposal unit. As discussed below, these RCRA corrective action provisions will have a far-reaching impact on ANL. The RCRA program includes regulations governing management of underground storage tanks containing hazardous materials or petroleum products. The IEPA has been authorized to administer most aspects of the RCRA program in Illinois, except for toxicity characteristic waste and organic solvent emissions.

The current part A (interim status) permit lists two HWMU units which were formally closed during 1994. These units are the water reaction tank, used in the past for treatment of alkali metals and other water reactive materials, and the shock-sensitive treatment area, used for treatment of highly unstable or explosive materials. Both units are located in the 317 Area. ANL was granted interim status under RCRA after submitting a notification of Waste Handling Activities and a Part A application in 1980. In 1990, a new Part B permit application (one had previously been sent to the EPA but not acted upon) was prepared for submittal to the IEPA, which had been granted authority to administer most of the RCRA program. The application was submitted to the IEPA and EPA on December 21, 1990. Revisions to the permit application were submitted on June 17, 1991, and September 24, 1991, in response to IEPA and EPA comments.

The RCRA Part B Permit application was revised and updated in 1993. Revision I was submitted to the IEPA during November 1993, which includes information on four new portable hazardous waste storage units and a mixed waste storage tank. ANL responded to EPA notice of deficiency comments regarding the alkali metal passivation booths in Buildings 308 and 206 and incorporated the response into the revised application. Revision II of the Part B application was prepared to include a new hazardous waste storage facility, a new mixed waste storage facility, and a transuranic mixed waste storage facility. Revision II was submitted in 1995. IEPA will conduct a technical review of the Part B application and may issue ANL a RCRA draft permit soon.

A RCRA Facility Assessment (RFA) was completed by the IEPA during summer 1991. The RFA report from IEPA was received during late 1993 and identified 740 units [735 solid waste management units (SWMUs) and five Areas of Concern (AOC)]. The report identified 432 units (427 SWMUs and five AOCs) for further work. ANL prepared a report entitled "Proposed Revisions to the RCRA Facility Assessment Report for Argonne National Laboratory-East." This report included recommendations to reduce the number of units that IEPA identified in the RFA Report for further work from 432 units to 71 units (69 SWMUs and two AOCs). When the Part B permit is issued, it will most likely contain requirements to characterize and assess the SWMUs. ANL is working proactively to characterize and investigate these SWMUs with emphasis in the 800 and 317 Areas. ANL continues to abide by its Part A permit and the interim status standards found in 40 CFR 265 and 35 IAC Part 725.

The HSWA amendments to RCRA require that any Part B permit issued must include provisions for corrective actions for all releases of hazardous materials from any solid waste management unit (SWMU) at the site, regardless of when the waste was placed in the unit.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - East** (Continued)

#### **Regulatory Drivers** (Continued)

When issued, the Part B permit will contain a compliance schedule which will govern the characterization and any required remediation of such units. The Part B permit application submitted to the IEPA identified and provided information on 56 SWMUs, both active and inactive. The recently issued RFA report from the IEPA identified more than 700 SWMUs (see Section 2.3.2.). The great majority of these sites are believed to contain little or no residual contamination; however, a number may be required to undergo some type of corrective action. The process of conducting detailed characterization studies to determine if hazardous materials have been released from a number of these units was begun in 1989. More extensive characterization is currently underway at a number of the SWMUs in accordance with the IEPA-approved corrective action work plans for the 800 Area and 317/319 Areas. Interim removal action for two SWMUs were also being implemented.

The Draft Site Treatment Plan (DSTP) was submitted to the DOE for review in August 1994. The DSTP outlined the mixed waste on-site and identified several potential treatment options for each waste stream. The Proposed Site Treatment Plan (PSTP) was submitted to the DOE which in turn submitted it to the state in March 1995. The PSTP identifies six on-site treatment systems and one off-site treatment system that ANL proposes to use for its existing inventory of mixed waste. Once the PSTP is approved by the state, treatment schedules for the various mixed waste streams in the ANL inventory will be developed and the hazardous constituent treated in compliance with RCRA regulations.

#### **ANL-E Waste Management Activities**

Waste operations at Argonne National Laboratory East (ANL-E) includes all programmatic and administrative management, technical support, and day to day operations. The waste management (WM) activities include base management and waste minimization projects, as well as the specific activities required for the collection, treatment, storage and disposal of waste generated by research activities. Waste types managed at the Laboratory includes transuranic (TRU), radioactive low-level, mixed radioactive low level, hazardous, special wastes regulated by the state, and sanitary waste.

The Laboratory treats a number of the waste streams generated on-site. Treatment methods of low-level radioactive wastes include: the opening and inspection of low-level solid waste containers to remove materials that cannot be accepted by the chosen disposal facility; the segregation of compactible waste from non-compactible waste; and the shredding and compaction of eligible material. Liquid low-level waste is treated by evaporation and subsequent concentration, solidification, and stabilization. Treatment of hazardous waste on-site includes: repackaging waste containers for maximum efficiency and neutralization of corrosive waste. Other than corrosive hazardous waste, most hazardous waste generated at the site is shipped off-site to commercial facilities for treatment and ultimate disposal. Treatment of mixed low-level radioactive and hazardous waste includes: incineration (at an off-site commercial facility) and photo-oxidation of organics; solidification and stabilization of solids and liquids; neutralization and precipitation of heavy metal liquids; decontamination of solid heavy metals; and amalgamation of mercuric waste. Treatment of TRU waste includes neutralization and stabilization, and then packaging to meet the WIPP criteria for disposal.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Argonne National Laboratory - East** (Continued)

#### **ANL-E Waste Management Activities** (Continued)

Waste requiring disposal is shipped to a combination of both DOE and commercial facilities. Hazardous waste requiring disposal is shipped to a variety of commercial facilities depending on the characteristics of the waste. Low-level radioactive waste is primarily shipped to the DOE Hanford site. Soils generated from radioactive waste clean-up/stabilization activities may be shipped to the Envirocare Facility in Utah.

The WM base program supplies necessary managerial and technical support to the waste generators and waste operations personnel. Included is the management of numerous RCRA-permitted storage and treatment units, four nuclear facilities (three Hazard Category 3 and one Hazard Category 2), multiple radiological facilities, storage areas for Toxic Substances Control Act (TSCA) regulated wastes, storage areas for state-regulated wastes, and storage areas for supplies and materials. In addition, training and all administrative activities are part of the base program.

The Waste Minimization program is managed and tightly integrated into the waste management program. A base program is currently funded to support tracking of waste reduction and completion of program reporting requirements. A number of return-on-investment projects are funded for FY 1997 including alternative analytical chemistry sample analyses, demonstration of solvent recovery in chemistry laboratories, waste tracking system upgrades, and implementation of past pollution prevention opportunity assessment (PPOA) findings. In addition, a site specific hazardous waste benchmarking study, a PPOA focused on future D&D plans, and a technology transfer workshop on microchemistry, are on-going efforts to reduce waste on-site and in the surrounding communities.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Brookhaven National Laboratory**

#### **Introduction**

Brookhaven National Laboratory's missions support the Department of Energy's scientific and technical role in implementing the National Energy Strategy. This strategy "...calls for continued and significant investments in fundamental science and engineering research and in the associated advanced training of scientists and engineers. These investments are seen as preconditions for reaping the practical benefits of energy sciences and technology in the future." The National Energy Strategy further emphasized that "Forefront research facilities are vital to U.S. leadership in both science and industrial research. However, they can be expensive and may require frequent upgrades to address new problems and challenges. They also must be staffed with scientists, engineers, and technicians who have solid training and who are informed about research progressing worldwide."

Brookhaven National Laboratory has three primary missions. The first is to conceive, design, build, and operate large, complex research facilities for the benefit of the entire scientific community in a safe and environmentally sound manner. These facilities, such as particle accelerators and colliders, nuclear reactors and synchrotron storage rings, are used for fundamental scientific studies and for both basic and applied research in energy-related physical, life, and environmental sciences.

The second mission is to carry out research in basic science programs which potentially have long-term payoffs. Many of these programs employ the unique facilities mentioned above; others take advantage of the special expertise and ancillary support services and facilities at the laboratory. The ease of engaging in collaborative efforts with outside users, from universities, industries, and other government laboratories, greatly enhances the effectiveness of the programs and encourages a wide-based use of the special facilities at Brookhaven.

The third mission is to contribute to the technology base of the nation. The Laboratory is engaged in developing new technologies and facilities, and transferring this new knowledge to the commercial sector. Brookhaven is involved in the education of scientists and engineers through a wide variety of cooperative research programs. The Laboratory has other extensive educational programs covering a broad spectrum of people, reaching from elementary school through university students and faculty.

As a national resource, Brookhaven makes available, when feasible and consistent with its mission, its unique facilities and expertise to state and federal agencies and to the private sector.

When Brookhaven National Laboratory opened it was one of three national laboratories, places where federally funded facilities could be built that were beyond the resources of individual universities. In the late 1940s, this meant nuclear reactors and particle accelerators, although, at that time, forefront accelerators still could be built at universities.

Brookhaven's first generation of these two types of machines were completed in the early 1950s. The Brookhaven Graphite Research Reactor (BGRR) went into operation in 1950, and the Cosmotron, a proton synchrotron that was the first particle accelerator to surpass 1 billion electron volts (GeV) was dedicated in 1952. Completion of each machine had a significant impact upon the Lab, because supporting facilities and experimental equipment had to be built, along with special arrangements for power, security, waste disposal, and so forth.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Brookhaven National Laboratory** (Continued)

#### **Introduction** (Continued)

A hot lab, to handle nuclear engineering and chemistry, was built in 1951, and a medical research reactor, completed in 1958, was part of a new medical research facility. Two major, low-power accelerators also served Brookhaven low-energy nuclear physics and irradiation programs: a 3.5 million electron volts (MeV) Van de Graaff accelerator, and a 60-inch cyclotron. Both originally were built by industry but had to undergo major renovations by Brookhaven scientists before they became suitable for research work.

As a result of these research activities, radioactive substances and a number of substances defined as hazardous under federal and state regulations have been and are being acquired, used, stored, and disposed of at Brookhaven National Laboratory.

The four designated national user facilities--the Alternating Gradient Synchrotron (AGS), National Synchrotron Light Source (NSLS), Scanning Transmission Electron Microscope (STEM), and the High Flux Beam Reactor (HFBR) serve the scientific user community from both the United States and abroad and are currently the centerpieces of the industrial/commercial land use area. The Relativistic Heavy Ion Collider (RHIC), now under construction, will be an additional unique national user facility within this land use category. Approximately 3 hectares of Laboratory site is leased to the U.S. Department of Commerce for the NEXRAD weather radar facilities. These facilities are part of a National Weather Forecast Network operated by the National Oceanic and Atmospheric administration (NOAA). Other facilities housing nine scientific departments, four scientific support divisions, and thirteen support divisions are also within this industrial/commercial area. With the exception of the Sewage Treatment Plant and the Hazardous Waste Management Facility (to be relocated), the industrial/commercial facilities form the developed central area of the site.

#### **Regulatory Drivers**

On December 21, 1989, Brookhaven National Laboratory was included as a Superfund Site on the National Priorities List (NPL). The United States Environmental Protection Agency (USEPA) Region II and the New York State Department of Environmental Conservation (NYSDEC) have determined that BNL constitutes a facility as defined by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (Section 121, 42 U.S.C. 9601-9675) and an inactive hazardous waste disposal site as defined by New York State Environmental Conservation Law (ECL). BNL is also subject to Section 3004(u) of the Resource Conservation and Recovery Act (RCRA), which requires that a permit issued after the date of enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA) provide for corrective action for all releases of hazardous waste or constituents from any solid waste management unit (SWMU) at a treatment, storage, or disposal facility seeking a permit, regardless of the time the waste was placed in such a unit. In addition, RCRA Section 3004 (v) requires that corrective action must be taken beyond the facility boundary where necessary to protect human health or welfare or the environment unless the owner or operator is unable to obtain the necessary permission to take the corrective action despite best efforts to do so. The IAG became effective in 1992.



## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Brookhaven National Laboratory** (Continued)

#### **Regulatory Drivers** (Continued)

The IAG provides the overall framework for conducting the BNL environmental restoration program and uses CERCLA and NCP processes. The IAG defines authorities between the three parties and includes procedures for dispute resolution, assessment of stipulated penalties by EPA, document reviews, reporting and notification, schedule extensions, compliance with Applicable and Relevant and Appropriate Requirements (ARARs) and reimbursement of New York State oversight costs.

CERCLA requires that remedies be protective of public health and the environmental and meet ARARs which are promulgated federal and state standards. It must be noted that the BNL IAG, CERCLA and the NCP require the use of State standards when more strict than federal. Another category is a To Be Considered (TBC) which include unpromulgated guidance and standards such as NYSDEC Technical Administrative Guidance Memorandum (TAGM) series developed for State's Inactive Hazardous Waste Site Remediation Program and DOE Orders.

There are two companion permits to the BNL IAG: a Hazardous and Solid Wastes Amendment Act (HSWA) permit from EPA for RCRA Corrective Actions (since NYSDEC program was not authorized at the time) and a NYSDEC Hazardous Waste (6NYCRR 373) permit for mission related hazardous waste operations at BNL. Both of these permits defer RCRA corrective actions to the IAG.

Environmental restoration activities are not required to actually obtain permits under CERCLA, the NCP and the BNL IAG for onsite activities, however the substantive requirements of any permits must be met. Permit equivalency applications are submitted to the appropriate IAG party and any needed monitoring activities and operational requirements are subsequently issued.

#### **Environmental Restoration Activities**

There are currently twenty-eight "Areas of Concern" (AOCs) at the BNL site to be addressed through an IAG. The AOCs consist of active facilities, such as the Sewage Treatment Plant (STP), the Hazardous Waste Management Facility (HWMF), and potable wells; and inactive facilities, such as two former landfills, cesspools, and radioactive waste storage tanks. The AOCs are grouped and prioritized into Operable Units (OU's) and Removal Actions (RAs). Based on the current program baseline maintenance of pump and treat activities are expected to extend to the year 2013. However, this schedule could be affected by changes in the funding profile and the scope of specific remediation actions selected as a result of the ongoing Remedial Investigation/Feasibility Study (RI/FS) process.

#### **Waste Management Activities**

Brookhaven National Laboratory currently manages hazardous waste, low-level radioactive waste, and low-level mixed waste that is generated by on-going research and development activities. BNL does not generate any transuranic waste. BNL has an approved Part B permit for hazardous waste. Limited treatment of waste such as volume reduction and stabilization prior to shipment to off-site facilities for treatment and disposal is expected to continue.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Brookhaven National Laboratory** (Continued)

#### **Waste Management Activities** (Continued)

Large-scale treatment trains and on-site waste disposal facilities are not planned at this time. Treatment of waste is limited to size and volume reduction, consolidation, and packaging for shipment to off-site treatment and disposal facilities. Brookhaven National Laboratory stores waste in accordance with the provisions of its RCRA Part B Permit, large-quantity generator status. Hazardous waste is sent to commercial facilities for disposal; low-level waste is shipped to DOE's Hanford, Washington facility for disposal. Mixed waste is sent off-site to commercial treatment/disposal facilities.

Waste minimization and pollution prevention includes operations such as recycling, recovery, and materials substitution to reduce the burden on off-site treatment, storage, and disposal facilities. Working groups are established within each BNL department and division to evaluate each waste generating process and recommend strategies for reducing waste.

### **AMES Laboratory**

#### **Introduction**

The Ames Chemical Disposal Site (CDS) is located north of Ontario Street off Scholl Road on property owned by Iowa State University (ISU) near Ames, Iowa. The CDS is east of the Applied Sciences Complex, the former site of the Ames Laboratory Research Reactor. It consists of approximately 80,000 square feet in the east half of the southeast quarter of Section 32, Township 84 North, Range 24 West. The perimeter of the site has been fenced with chain link since 1958.

The Site is located outside the city limits of the City of Ames. The core of the City's population is located primarily south and southeast of the Site. Census data (1990) indicates 47,100 people are within the city limits of Ames. The city limits of Ames are located within a three mile radius of the Site. The City of Ames has ten schools, one university and one hospital.

The site is on University owned property and it is the University's intent to leave the site in its existing state. However, it is conceivable that the University may wish to build a warehouse on the processing pad that remains from the interim removal action. DOE plans for the site are long term monitoring with natural attenuation (subject to completion of feasibility study, proposed plan and negotiations with regulators).

The Site is located at the top of a hill. The area where the burial pits were located generally slopes to the southeast. Surface water features closest to the Site are Squaw Creek, located approximately one-third mile east of the site, and Onion Creek Gulch, located approximately one-quarter mile west of the site. Ravines are located to the south, east and north of the site. The ravine directly to the east of the Site contains water only intermittently. The ravine to the north appears to be dry throughout the year. Drainage from the area of the burial pits is directed towards Squaw Creek via the east ravine.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **AMES Laboratory** (Continued)

#### **Introduction** (Continued)

The CDS was active from 1958 through 1966. Chemical and radiological waste was buried in nine (9) unlined pits varying in size, the largest being forty (40) feet by twenty (20) feet, and all approximately seven to eight (7-8) feet deep. Known pits were located in the southeast corner of the site. Historical waste burial documents state the wastes were contained in steel pails, drums, glass containers and plywood boxes. These documents state the constituents of the wastes to contain both radiological and hazardous elements. Based on analytical results of the excavated wastes, no hazardous constituents, as defined by RCRA, were found. During the source removal all wastes were shipped as "low level radioactive".

In 1980 and in 1987, two separate assessments for surficial radioactive contamination were conducted by Ames Laboratory at the CDS. A total of five (5) volumes of contaminated soil were identified, removed, and properly disposed. In 1980, soil was removed from the "uranium burn area". In 1987, more soil was removed from the burn area and from three (3) newly identified areas.

In September 1989, Ames Laboratory installed two (2) monitoring wells and one (1) reference well next to the burials to define potential soil and groundwater contamination. Sample analyses indicated no radiological threat to the public or the environment, however, only limited analyses for potential hazardous waste contamination at the site were performed.

#### **Regulatory Drivers**

In 1990, the State of Iowa Department of Natural Resources was prepared to add the CDS to the State's Registry of Abandoned and Uncontrolled Waste Sites in accordance with Section 455B.426b of the Code of Iowa. The proposed classification was level "B - Significant threat to the public health or the environment - action required". The classification was contested, and on June 27, 1991, it was downgraded to "C - Not a significant threat to the public health or the environment - action may be deferred". However in the interim, a remedial strategy had been developed and a work plan written to characterize the site for the presence of potentially hazardous waste. The original (Phase I) RI was performed in FY 1993. An EE/CA, draft FS and draft RAP (groundwater RD) were produced in FY 1994. By an inter-agency agreement between the Corps of Engineers and DOE-Chicago, a source removal interim action was initiated in the fall of 1994 and completed in the spring of 1995. The draft FS, based on investigative activities to that point, has been shelved by the regulators pending more site investigation, know as the Phase II RI. Downgradient vegetation was sampled in the summer of 1995 as part of the Phase II RI. In addition, groundwater hydrology and groundwater monitoring is being assessed.

No disposal or waste management activities are know to have occurred on the Site since 1966. An Interim Removal Action (IRA) at the Site to remove the waste material from the burial pits was conducted by the US Army Corp. of Engineers under contract to the US Department of Energy (US DOE). The excavation of the materials was completed in the fall of 1994. All materials were disposed at off-site facilities. The results of the IRA were presented in a site closure report ( 1995) which presented the nature of the wastes removed and residual contamination.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **AMES Laboratory** (Continued)

#### **Project Objectives**

This project involves the validation and reporting of four rounds of water sampling, the Phase II Remedial Investigation Report (RI), and the Focused Feasibility Study and Proposed Plan (FFS/PP). The FFS/PP has been accelerated. Remediation strategy at the site is following EPA CERCLA guidance, the Iowa Administrative Code, DOE's policy on graded approach, applicable DOE Orders and OSHA Regulations to meet all applicable regulatory requirements. Components of the Phase II RI include:

- Groundwater and Surface Water Sample Analysis Validation in accordance with US EPA's National Functional Guidelines, or equivalent.
- Quarterly Water Quality Reports which will include analytical summary tables, data quality summary reports, a description of field observations, and a potentiometric map of the water table aquifer.
- The Phase II RI Report which will present contaminant fate and transport and a human health risk assessment. If appropriate, groundwater will be modeled to demonstrate the potential for receptors to be impacted by the site using the model methodology established in the Phase I RI.
- Focused Feasibility Study/Proposed Plan. The Focused Feasibility Study will revise the Draft Feasibility Study of March, 1994. Based on existing site knowledge, it is assumed that long-term groundwater monitoring or no further action will be the recommended remedial option in the Proposed Plan.
- Regulatory liaison, project meetings, and community relations.

#### **Waste Management Activities**

The Ames Laboratory is located near the City of Ames, Iowa on property owned by Iowa State University (ISU) and occupies twelve buildings. The Laboratory also leases space in three ISU buildings. Ames Laboratory conducts basic and intermediate-range applied research in physical, mathematical and engineering sciences that support energy technologies. Laboratory activities involve less than ten percent of the total chemical use and one percent of the radioisotope use on the ISU campus.

Pollution prevention and waste minimization programs and plans are being updated. Included in this plan is waste paper recycling, recycling salvage metal, and recycling used oil. Nearly all chemical and radiological "legacy" wastes have been properly disposed.

This activity supports the base waste management program and those activities that support the operation of a research facility in the area of waste management. This includes recycling, waste minimization, and disposal of waste resulting from research laboratory operations.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **AMES Laboratory** (Continued)

#### **Waste Management Activities** (Continued)

Collection, transportation, and disposal costs are an integral part of the waste management activity. Waste typically includes contaminated duct work, drain lines, research-level quantities of potential hazardous chemicals and laboratory equipment. In addition, continuous operation requires administrative activities such as preparation and maintenance of waste generator forms and required annual waste operations reports. Program management for this activity consist of program planning and direct management of projects. Primary landlord responsibilities belong to the DOE Office of Energy Research.

### **Princeton Plasma Physics Laboratory**

#### **Introduction**

Princeton Plasma Physics Laboratory (PPPL) is located on C and D sites of Princeton University's James Forrestal Campus, encompassing an area of approximately 72 acres leased to the Department of Energy (DOE) for 40 years. The primary mission of PPPL is magnetic confinement plasma physics fusion energy research. The goal of the magnetic Fusion Energy Research program is to develop and demonstrate the practical application of fusion power as an alternative energy source. PPPL has been engaged in fusion energy research since 1951 and at its present location since approximately 1959, with construction of new facilities occurring up to 1980. Presently, PPPL has two large tokamak devices, namely, the Princeton Beta Experiment-Modification (PBX-M) and Tokamak Fusion Test Reactor (TFTR). Upon conclusion of environmental restoration activities at PPPL, the property would continue to be leased by DOE for continuing fusion energy research activities.

#### **Regulatory Drivers**

Memorandum of Understanding (MOU) between Princeton University and the New Jersey Department of Environmental Protection (NJDEP), dated February 1993. Princeton University, as the landowner and leasor of Site C/D, entered into a Memorandum of Understanding with the State of New Jersey Department of Environmental Protection (NJDEP), dated February, 1993 for the environmental restoration of Site A/B and Site C/D (PPPL) of the James Forrestal Campus. The MOU granted to Princeton University in lieu of an Administrative Consent Order thus allowing more flexibility in the schedule of reports and consideration of remedial strategies. Site C/D in not a CERCLA site under the oversight of the Federal EPA.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Princeton Plasma Physics Laboratory** (Continued)

#### **Environmental Restoration Activities** (Continued)

Several focused environmental investigations were conducted at PPPL in the late 1980's and early 1990's. They included a site-wide soil vapor survey, conducted in compliance with the facility's NJPDES Discharge to Ground Water permit. This survey detected chlorinated volatile organic compounds (VOCs) and polyaromatic hydrocarbons (PAHs) in several areas of the site. The VOCs are common components in degreasing and cleaning solvents and PAHs are components of gasoline and other fuels. Based on the findings of the soil vapor survey, a ground water investigation was conducted in late 1990. This investigation included the installation and sampling of 18 monitoring wells.

In FY 1995, PPPL conducted soil and ground water sampling as specified in the Remedial Investigation Work Plan (RIWP) under the MOU with NJDEP. Soil sampling in five of the seven Areas of Potential Environmental Concern (APEC) did not detect contaminants above NJDEP Soil Cleanup Criteria. Thus, these areas have been identified for "no further action" requests. Base-neutral organic compounds (Bns) were detected in sediments from the C-Site drainage swale and chromium was detected in the vicinity of the C-site Cooling Tower at concentrations exceeding NJDEP cleanup criteria. In addition, soil and ground water sampling did not clearly identify a source for VOCs detected in on-site monitoring wells (principally in the CAS-RESA area). These sampling results indicate the need for installation and sampling of several new monitoring wells to meet the requirements for NJDEP regulations and guidance documents.

Two of the seven Areas of Potential Environmental Concern (APECs) have contaminants at concentrations above NJDEP cleanup criteria in the soil as noted above. Low levels of VOCs have been detected in the ground water at a few areas on both C and D sites. The highest levels have been identified in wells located along the southern boundary of the site, adjacent to wetlands and the CAS/RESA buildings. Shallow and intermediate ground water at the site flows to several deep building dewatering sumps. These sumps act as a ground water capture system and discharge to an on-site detention basin which flows to nearby surface water bodies.

Phase I soil sampling results indicate that only two of the seven APECs identified in the Remedial Investigation Work Plan (RIWP) have soil contamination exceeding the NJDEP cleanup criteria. Approximately 200 cubic yards of soil in the vicinity of the C-Site Cooling Tower contain chromium above the NJDEP cleanup criteria. Approximately 50 cubic yards of soil in the C-Site Drainage Swale contain base-neutral Organics (BNs) above the NJDEP cleanup criteria. The quantity of contaminated ground water has not been fully delineated at this time. Soil remediation will be achieved by expedited removal action in the two APECs (Cooling Tower and Drainage Swale). Contaminated soil in these areas will be excavated for off-site treatment or disposal.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Princeton Plasma Physics Laboratory** (Continued)

#### **Environmental Restoration Activities** (Continued)

At this time, ground water contamination is not clearly attributable to PPPL, and contaminated ground water is captured by the building dewatering pumps. Based on meetings with the New Jersey Department of Environmental Protection, if ground water contamination is not clearly attributable to PPPL, DOE would not be required to implement active ground water remediation. Instead, the existing building dewatering sumps would be used to control the migration of contaminants and a “natural remediation” process would be allowed to reduce contaminant concentrations over time. Ground water monitoring would be required to monitor and evaluate the natural remediation processes. Under this scenario, an Aquifer Classification Exception Area (CEA) would be designated in those areas where contaminant concentrations exceed the Ground Water Quality Standards. The CEA would provide regulatory relief from those standards for specific contaminants for a specific period of time. Regular ground water monitoring is assumed for a minimum of five years after the completion of the removal actions described above.

#### **Waste Management Activities**

Wastes generated by PPPL include oils, solvents, PCBs, heavy metals and low-level radioactive wastes. PPPL does not treat or dispose of waste on-site. Hazardous wastes are sent to commercial facilities; radioactive wastes are shipped to DOE’s Hanford, Washington facility. Waste are handled in accordance with RCRA regulations as they are generated by on-going research and development activities.

PPPL has constructed a new Radioactive Waste Handling Facility to store prepackaged radioactive waste. The Facility is approximately 5800 square feet and has an expected useful life of 30 years. The facility has a ten ton crane and a 15” concrete floor. The sixty-seven foot wide by eighty-six foot long facility serves as the focal point for the preparation of radioactive waste materials for shipment to disposal sites.

Waste management activities have not included any EM-40 restoration derived wastes, since none have been generated other than small quantities generated during sampling events. No legacy wastes exist at PPPL Site C/D. Restoration-derived wastes from the removal of underground storage tanks and associated TPH contaminated soils were excavated and shipped off-site to a recycling facility for reuse in asphalt road paving.

Anticipated impacts to the PPPL waste volumes and costs are directly related to programmatic decisions affecting the shutdown of TFTR. Large quantities of wastes would be generated upon project closure. This Plan assumes that these activities would be managed by the landlord, the Office of Energy Research.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Fermi National Accelerator Laboratory**

#### **Introduction**

The Fermi National Accelerator Laboratory (Fermilab) is located in Batavia, Illinois, about 30 miles west of the City of Chicago. The Fermi National Accelerator Laboratory began its mission as a single-program research and development facility for the Department of Energy (DOE) in 1972 when the first accelerator at the laboratory began operations. The Fermi National Accelerator Laboratory's mission is to conduct research in high-energy physics. This involves acceleration and collision of subatomic particles and an examination of the products of these interactions. Protons are accelerated via a series of five machines of increasing size and capability. After acceleration, protons may be extracted and sent to one of the three fixed target areas, or they may be kept in the accelerator and used in collisions with antiprotons traveling in the opposite direction. The information gained from these studies contributes to understanding the basic nature of matter and forces.

#### **Waste Management Activities**

Fermilab has no plans for treatment or disposal facilities on-site. Waste operations will continue as long as the laboratory generates waste. All waste is sent off-site for appropriate treatment, as required. Fermilab generates hazardous wastes, as defined by RCRA regulations (40 CFR Part 261) incident to accelerator operation and maintenance. Fermilab has a RCRA permit to operate a hazardous waste storage facility. The permit was issued by the Illinois Environmental Protection Agency (IEPA) and the United States Environmental Protection Agency (EPA). Fermilab collects, handles and stores all RCRA hazardous wastes in accordance with permit provisions. Hazardous wastes typically consist of 15% RCRA, 30% TSCA and 55% Illinois Special (nonhazardous) by volume. This includes corrosives, cleaners, solvents, asbestos, PCBs, lubricating oils, coolants, adhesives, spill cleanup debris and miscellaneous chemical products. The typical total volume of hazardous waste disposed of is less than 50,000 gal. per year. Fermilab utilizes brokers and commercial facilities for the final disposition of hazardous waste.

Laboratory operations also generate "special wastes" as defined by the Illinois solid waste regulations, radioactive mixed wastes, and low-level radioactive waste (LLW) in small amounts. The Laboratory regularly packages and ships regulated wastes to authorized treatment/disposal facilities and has no backlog of "legacy" wastes.

The Laboratory is engaged in a long-term project to clean up soils contaminated with polychlorinated biphenyl compounds (PCBs). The soils are near electrical transformers located along the main accelerator ring. The cleanup can occur only during accelerator shutdown periods. This activity is expected to be completed in 2004, pending Main Ring operation schedules.

Fermilab is conducting a RCRA Facility Investigation (RFI) as a condition of the RCRA permit for a hazardous waste storage facility at Site 55. The purpose is to investigate and remediate, where necessary, confirmed hazardous constituent releases to the environment. IEPA originally identified 17 Solid Waste Management Units (SWMUs) in the RCRA permit that required investigation. Fermilab subsequently notified the IEPA of four new SWMUs and a change in status of one of the original SWMUs.



## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Fermi National Accelerator Laboratory**(Continued)

#### **Waste Management Activities** (Continued)

Fermilab completed an RFI Phase I investigation (presence or absence of hazardous constituents) of the original 17 SWMU's in July 1994. Based on the Phase I sampling results, the IEPA determined that no further action was needed at 10 SWMU's, two SWMUs would need a Phase II investigation to define rate and extent of contamination, one SWMU needed to be resampled based on newly-defined concerns, more information was required for one SWMU and the IEPA would provide closure for the remaining SWMU.

Fermi submitted a draft workplan for the Phase II Investigation at two SWMUs to IEPA for review on September 8, 1995, and will submit a plan for Phase I sampling at the four newly-identified SWMUs to IEPA in November 1995.

Fermilab generates low level radioactive and very small quantities of low level mixed wastes as a consequence of particle accelerator operation and related support activities. Low level radioactive waste is shipped to DOE's Hanford, Washington facility for disposal. Operations involve the routine handling of low-level radioactive wastes and the routine processing of radioactivity contaminated NaCl. Although NaCl is not a RCRA hazardous waste, it is a State of Washington "dangerous waste". Therefore, radioactivity contaminated NaCl is considered a mixed waste at Hanford. This waste results from the regeneration of ion exchange resin at the Central Utilities Building. Processing involves examination of solids which have been initially identified as "radioactive" waste to determine whether or not they are, in fact, radioactive. Items are removed from containers, physically isolated, and checked for radioactivity. For about 20% of the waste, no activity is found and the items are sent to a municipal landfill or to a commercial reclaimer. About 50% is repackaged for off-site shipment to Hanford. The remaining 30% is "potted" into cement shield blocks. Potting involves partially loading steel forms with low-level radioactive material than filling the open space with concrete. Oil is solidified by a subcontractor using a special cement to assure adequate mixing. Solidification takes place in the new low level radioactive waste handling building.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Piqua Nuclear Power Facility**

The Piqua Nuclear Power Facility is located in southwestern Ohio, north of Dayton, on the east bank of the Great Miami River in the southeastern portion of the town of Piqua, Ohio. The Piqua Nuclear Power Facility is currently undergoing surveillance and maintenance activities under the purview of the CH EM program.

The Piqua Nuclear Power Facility contained a 45.5 megawatt (thermal) organically cooled and moderated reactor which had been built and operated as a demonstration project by the US Atomic Energy Commission between 1963 and 1966. The facility was dismantled and decommissioned between 1967 and 1969; the reactor fuel, coolant, and most of the radioactive materials were removed from the site. The reactor vessel and the spaces between the vessel and cavity liner were filled with dry quartz sand.

There is currently no contamination in evidence outside the containment structure. The inventory of primary radionuclides remaining in the storage structure includes iron-55, cobalt-60, carbon-14, and beryllium-10.

The Environmental Management at the site is currently scheduled to end in fiscal year 2018, with no further activities planned after that time. At that time, the current plan is that the site will be transferred to the town of Piqua, Ohio.

Although the potential for transport of radioactive materials stored in the reactor complex to the environment is insignificant, under the terms of the lease agreement (contract number: DE-AC02-76EV01798) between the US Government and the Village of Piqua, the US Department of Energy is responsible for the nuclear safety of the land and structures. The Chicago Operations Office will be responsible for implementing remedial measures should activity be detected outside the facility. At the same time, the results of the surveillance activities conducted to date verify that there has been no detectable release to the environment from the decommissioned facility.

There are no current or planned activities related to assessment, remedial actions, stabilization, decommissioning, and treatment/storage/disposal. This facility will be transferred in FY 1998 to the Grand Junction Project Office for surveillance and maintenance.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Hallam Nuclear Power Facility**

The Hallam Nuclear Power Facility is located on a small portion of the 640-acre site of the present Sheldon Power Station, owned by the Nebraska Public Power District. It is located in Lancaster County in southeastern Nebraska, approximately 19 miles south of Lincoln. The entombed reactor is located slightly southeast of the center of the site. The Hallam Nuclear Power Facility has no current mission. Activities at the site are limited to semi-annual surveillance and maintenance.

The Hallam Nuclear Power Facility was a 240 megawatt (thermal) sodium-cooled graphite-moderated nuclear reactor which was built and operated by the US Atomic Energy Commission between 1962 and 1964. In 1967, the Nebraska Public Power District was authorized to decommission and dismantle the facility. This activity ended in 1969, and the facility was retired by the US Atomic Energy Commission in 1971.

There is currently no contamination in evidence at the site. Potential contaminants include nickel-63, cobalt-60, iron-55, manganese-54, samarium-151, cesium-137, strontium-90, and tritium. All these materials were located within the entombment structure in area 1 (reactor vessel and vessel containment structures), area 2 (fuel and storage pit #3 thimbles), or area 3 (moderator element storage cells).

There are no current or planned Nuclear Material and Facility Stabilization projects at the Hallam Nuclear Power Facility. All waste management activities are conducted within the scope of environmental restoration. The Environmental Management at the site is currently scheduled to end in fiscal year 2005, with no further activities planned after that time. At that time, the current plan is that the site will be transitioned to the Nebraska Public Power District. Future use of the facility is assumed to remain restricted.

Presently, there are no discussions being conducted or scheduled with local stakeholders. Officials from the Nebraska Department of Health are included in the planning and implementation of the semi-annual groundwater sampling activities. Results of the sampling work are provided to state officials.

Although the potential for transport of radioactive materials stored in the isolation structure to the environment is insignificant, the DOE Chicago Operations Office has agreed with the Nebraska Department of Health to conduct environmental radiological surveillance semi-annually to verify that no radioactivity is being released to the environments. The basis for radiological surveillance was previously established while a contract termination agreement was in effect that involved the Nebraska Public Power District and the US Atomic Energy Commission. In addition, The Chicago Operations Office and the Nebraska Department of Health agreed to install a shallow groundwater monitoring system as part of the environmental surveillance program.

There are no current or planned activities related to assessment, remedial actions, stabilization, decommissioning, and treatment/storage/disposal. This facility will be transferred to the Grand Junction Project Office in FY 1998 for surveillance and maintenance.

## **Appendix I - Site Activities and Facility Descriptions** (Continued)

### **Site A / Plot M**

Site A/Plot M is located within the Palos Forest Preserve in Cook County, Illinois. The site is owned by the Forest Preserve District of Cook County. Site A/Plot M is currently undergoing monitoring data from groundwater, soil and air sampling conducted throughout the year to affirm that no significant changes are occurring. Surveillance and maintenance activities have been on-going at Plot M since 1973 and expanded to include 17 new wells at Site A.

It is expected that Site A will be returned to the Forest Preserve District of Cook County when agreement is reached that the area can be returned to unrestricted use for hiking, picnicking and other recreational activities. The Environmental Management Program is committed to long term surveillance and monitoring of groundwater and surface streams, soil and air for a variety of hazardous compounds and radioisotopes. This activity will continue and be re-evaluated in 2005.

Site A/Plot M is the former site of early activities by the Manhattan Engineer District between 1942 and 1956. Site A contained two experimental nuclear reactors and associated research laboratories. Plot M was used for the burial of radioactive waste from experimental research at Site A. Initial work involved research and the development of radioisotopes and fission products for uses in defense and non-defense activities.

Environmental media of concern include air, groundwater and soils. Contaminants include low levels of various radioisotopes such as uranium and tritium and hazardous constituents such as VOCs, SVOCs, and heavy metals.

Various investigations, radiological surveys and studies of Site A have been performed. Completed in 1995, a comprehensive site characterization provided the nature and extent of radiological and chemical contamination of the soils, surface water, sediment and groundwater. This investigation noted several areas of surficial contamination, primarily in the form of heavy metals in shallow soils. A removal action was completed in FY1996. Waste materials are being shipped off site for disposal and the property will be returned to the Forest Preserve in FY1997.

This facility will be transferred to the Grand Junction Project Office in FY 1998 for surveillance and maintenance.

# Chicago Operations Office Environmental Management Office



## **Appendix III**

### **Project Baseline Summaries**

## **Appendix IV**

### **Site Baseline Summaries**

## **Appendix V**

### **Operations Office Baseline Summary**



## **Appendix VI**

**Opportunities**

**Issues**

## Major Opportunities

### Chicago Candidate Privatization Project #1

**Project Name:** Privatization of Brookhaven National Laboratory Graphite Research Reactor D&D

**Program:** EM-40

**Preparer:** Steve Webster, Phone (630) 252-2822

### Background

The Brookhaven Graphite Research Reactor (BGRR) was the first reactor built for the sole purpose of providing neutrons for research, and was in operation from August, 1950 to June, 1968 for a total of 18 years of service. The reactor was designed to be graphite-moderated and reflected, fueled with aluminum canned natural uranium elements, and cooled by air. At a later date in its operational history, the natural uranium fuel elements were replaced by aluminum-clad, enriched uranium alloy plate fuel elements. The reactor was designed as a graphite cube built from graphite blocks, penetrated in a north-south direction by parallel horizontal channels containing the uranium fuel elements. Filtered air was drawn through the fuel channels, and after filtering and cooling, discharged through the reactor stack.

The BGRR was shut down in June of 1968 with the introduction of the Brookhaven High Flux Beam Reactor (HFBR). Currently, the BGRR facility is used as a visitor's center, museum, and office area for other projects.

### IAG Status

Under the IAG, the BGRR was designated as Area Of Concern (AOC) 9, consisting of three sub-AOCs:

- 9A Canal - Sub-surface canal used for the transfer of reactor fuel elements.
- 9B Underground Ductworks - Ducts used for the flow of reactor cooling air. There is no mention of above-ground ducts but they are assumed also.
- 9C Spill Sites - sites surrounding the reactor building where spills of radioactive liquids and solids have occurred.

These sub-AOCs are external to the actual building housing reactor and were included in the IAG due to the potential for releases to the environment. Under DOE direction and formalized in the OU II/VII RI/FS Work Plan, investigative activities for these sub-AOCs were deferred to D&D of the BGRR. The BGRR actual building reactor is included in the BNL Release Sites Database and therefore included in the BNL EM-40 Program. BNL EM-40 plans to decontaminate and decommission (D&D) the entire facility. The D&D of the reactor is not scheduled under the current Interagency Agreement with EPA and the State of New York.

The D&D techniques envisioned at this time include the disassembly and decontamination of the reactor and its ancillary equipment, or entombment of the same. Primary concerns in evaluating the applicability of these methods would include public acceptance, worker safety, and cost effectiveness.

## **Major Opportunities** (Continued)

### **Chicago Candidate Privatization Project #1** (Continued)

#### **Options**

Options for the D&D of the BGRR are being identified at this time. One option is for the M&O to manage the D&D effort consistent with current DOE management practices. Another option is to privatize the effort.

#### **Description of privatization approach**

A privatization approach is in the preliminary stages of being developed. The approach would entail development of performance specifications for the D&D effort and solicitation of a contractor to perform the D&D effort under a fixed price contract.

#### **Issues**

Potential issues include:

- The level of characterization data available
- Liability
- Contractor solicitation (DOE prime contractor or a BNL subcontractor)

#### **Current Non-Privatized Baseline**

The non-privatized baseline has not been fully developed. The first step in determining if this effort is to be privatized is to definitize the baseline case.

#### **Basis for Determining if Privatization Would be Cost Effective**

Upon completion of the non-privatization baseline private firms will be contacted and the potential cost savings will be determined. A potential resource for this information will be the CH sponsored strategic alliance funded by EM-50 to integrate innovative technologies into the CP-5 Reactor D&D at Argonne National Laboratory. This alliance includes private industry, utility companies, universities and national laboratories.

#### **Confidence in Data**

Confidence in data is currently very low.

## **Major Opportunities** (Continued)

### **Chicago Summary of Other Major Opportunities**

#### **De Minimus Levels for Material Disposition**

The development of De Minimus levels for unrestricted release of recyclable materials would benefit CH sites as well all DOE sites. Of particular benefit would be the release of metals at BNL. These metals represent the majority of the legacy LLW at BNL. Other CH sites, including ANL-E, FERMI, and PPPL also have metals either in storage or in components that are currently in use but will soon no longer be needed.

#### **Consolidation of Contracts**

The consolidation of contracts for waste services will be explored. Currently each CH site contracts separately for hazardous waste disposal. Some sites contract for full services while others contract for disposal only. The hazardous waste management area is currently being benchmarked. Based on the results of that process CH will reevaluate the hazardous waste practices at CH sites. One potential outcome is the consolidation of contracts for hazardous waste management to gain volume discounts.

#### **Benchmarking**

CH is implementing benchmarking of laboratory processes among CH sites and against best in class industry practices to find efficiencies and cost savings. The first area that processes are being benchmarked in is hazardous waste management. If successful, the benchmarking process will be implemented in other areas.

## Major Opportunities (Continued)

### Issues

**Issue ID # 8.19** CH TYP does not include legacy waste or potential for many facilities to become surplus.

Legacy Waste issues at BNL are being addressed in the Plan. ANL-E legacy waste is currently being disposed of and ANL-W remote handled sodium contaminated TRU waste has been transferred to Nuclear Energy effective 10/1/97.

There is the possibility for facilities to become surplus at CH sites. Program uncertainty exist, particularly at ANL-W and PPPL. This uncertainty is identified in the Plan. This uncertainty is out of the control of the EM program and can not be planned for, particularly within flatlined budgets.

**Issue ID # 8.27** D&D of the Graphite Research Reactor at BNL shall be included in the revision.

The Graphite Research Reactor was and is included in the Plan.

**Issue ID #19.2** The Plan should address actions required to resolve legacy waste issues at ANL-E and BNL.

Legacy waste at ANL-E is currently being disposed of and is in the plan. BNL legacy waste will be disposed of in FY1998 and FY1999 and is in the plan.

**Issue ID # 20.2** The Environmental Measurement Laboratory mission to support EM activities throughout the complex needs to be discussed over the ten year period.

The EML mission is discussed in the plan and the plan describes actions being taken to determine the long term mission of EML.

**Issue ID # 20.25** Address treatment and disposal of sodium-contaminated legacy waste currently housed at ANL-W.

The responsibility for planning for the treatment and disposal of sodium-contaminated legacy waste currently at ANL-W for compliance with the INEL Site Treatment Plan and State of Idaho Governor Batt Settlement Agreement/Consent Order enforceable milestones has been transferred to Nuclear Energy effective 10/1/97.

## Appendix VII

### ADS / PBS Crosswalk

PBS NUMBER	ADS NUMBER
<b>CH001</b> ANL-E EM-40 Program Management	<b>CH1439</b> ANL-E EM-40 Program Management
<b>CH002</b> ANL-E Remedial Actions	<b>CH1440</b> ANL-E Remediation Activities
<b>CH003</b> ANL-E Decontamination & Decommissioning Actions	<b>CH1441</b> ANL-E D&D Projects
<b>CH004</b> ANL-E Waste Operations	<b>CH1300</b> ANL-E Facility Operations & Maintenance (Defense)
<b>CH005</b> BNL EM-40 Program Management	<b>CH1301</b> ANL-E Facility Operations & Maintenance (Non-Defense)
<b>CH006</b> BNL Remedial Actions	<b>CH2320</b> BNL Program Management
<b>CH007</b> BNL Decontamination & Decommissioning Actions	<b>CH2321</b> BNL Remediation Activities
<b>CH008</b> BNL Waste Operations	<b>CH2322</b> BNL D&D Projects
<b>CH009</b> AMES Remedial Actions	<b>CH2222</b> BNL Facility Operations & Maintenance
<b>CD010</b> AMES Waste Operations	<b>CH5210</b> AMES Remediation Activities
<b>CH011</b> 1 PPPL Remedial Actions	<b>CH5100</b> AMES Facility Operations & Maintenance
<b>CH012</b> PPPL Waste Operations	<b>CH3210</b> PPPL Remediation Activities
<b>CH013</b> ANL-W Remedial Actions	<b>CH3100</b> PPPL Facility Operations & Maintenance
<b>CH014</b> Chicago Prime Surveillance & Maintenance Activities	<b>CH1710</b> ANL-W Remediation Activities
<b>CH015</b> SITE A Cleanup	<b>CH8210</b> S&M Activities
<b>CH016</b> Princeton Site A/B Payments	<b>CH8207</b> SITE A Remediation
<b>CH017</b> Chicago Prime Legacy Waste	<b>CH8208</b> Princeton Site A/B Payments
<b>CH018</b> BNL Boneyard Removal	
<b>CH019</b> ANL-W Waste Operations	<b>CH1601</b> ANL-W Waste Management Activities
<b>CH020</b> FNAL Waste Operations	<b>CH4100</b> FNAL Facility Operations & Maintenance

## Appendix VIII

### BEMR / Plan

#### BEMR/PLAN COST AND SCHEDULE COMPARISON CHICAGO ENVIRONMENTAL RESTORATION ACTIVITIES

CH Site	BEMR Cost	Plan Costs	BEMR Completion	Plan Completion	Reason for Differences	Difference Category
ANL-E	\$169,602K	\$65,484K	2035	2006	Scope is better defined and competitive bidding process resulted in reduced costs. S&M function transferred to landlord (Energy Research)	1,3,4,5,6
ANL-W	\$21,031K	\$8,915K	2020	2006	Additional characterization has led to reduced scope. S&M function transferred to landlord (Nuclear Energy)	3,4,5,6
BNL	\$341,056K	\$182,823 K	2050	2006	Additional characterization has led to scope clarification resulting in improved estimates and efficiencies. Complete scope of D&D activities was not included in BEMR. Operation of groundwater containment systems to be transferred to landlord (Energy Research)	3,4,5,6,7
PPPL	\$59,000K	\$1,814K	2070	2001	Additional characterization has resulted in less required scope S&M requirements reduced and function transferred to landlord (Energy Research)	3,4,5
Prince-ton A/B	\$0K	\$8,317K	NA	2006	Scope and cost of this activity was not included in BEMR	6
Ames	\$2,235K	\$418K	2010	1998	Removal action already completed. S&M scope now completed in 1998 rather than 2010	1,4,5
Site A	\$6,006K	\$525K	2005	1997	Removal action already completed. S&M scope transferred to Grand Junction	1,4,5
Chicago Operations	\$160,416K	\$2,636K	2035	2005	Decrease in program management scope and transfer of activities to another DOE office	1,4,5

**BEMR/PLAN END STATE COMPARISON  
CHICAGO ENVIRONMENTAL RESTORATION ACTIVITIES**

CH SITE	BEMR END STATE	PLAN END STATE	PLAN COST DIFFERENCE	REASON FOR CHANGE IN END STATE
ANL-E	Physical removal or control of most contaminants, D&D of baselined facilities, and long term S&M	Cap and monitor rather than remove some contaminants, D&D of baselined facilities, long term S&M transferred to landlord (Energy Research)	\$104,118K	Additional characterization has resulted in reduced scope. Transfer long term S&M function to landlord (Energy Research)
ANL-W	Removal of significant quantities of contaminants and long term S&M	Removal of a significantly lesser amount of contaminants with long term S&M transferred to landlord (Nuclear Energy)	\$12,116K	Additional characterization has resulted in reduced scope. Transfer long term S&M function to landlord (Nuclear Energy)
BNL	Remove contaminants as prescribed by regulators and operate groundwater containment systems. D&D of BGRR facility	Remove contaminants as prescribed by regulators. Increase D&D scope resulting from additional characterization. Groundwater containment systems to be operated by landlord (Energy Research)	\$158,233K	Additional characterization has led to scope clarification resulting in improved estimates and efficiencies. Complete scope of D&D activities was not included in BEMR. Operation of groundwater containment systems to be transferred to landlord (Energy Research)
PPPL	Removal of significant quantities of contaminants and long term S&M	Removal of a significantly lesser amount of contaminants with long term S&M transferred to landlord (Energy Research)	\$57,186K	Additional characterization has resulted in reduced scope. Transfer long term S&M function to landlord (Energy Research)
PRINCETON A/B	NA	Remediate as agreed between Princeton University and state regulator	\$8,317K	Scope and cost of this activity was not included in BEMR
AMES	Extensive long term S&M	S&M only through FY 1999	\$1,817K	Results of risk assessment and land use controls reduced S&M requirements
SITE A	Remove contaminants and perform long term S&M	Removal of contaminants already complete. S&M function to be transferred to Grand Junction	\$5,481K	Long term S&M to be transferred to Grand Junction
CHICAGO OPERATIONS	Completion of all remediation activities associated with CH sites in FY 2035	Complete all remediation activities up to long term S&M	\$157,780K	Significant acceleration of CH projects resulting from reduced scope. Long term S&M function transferred to other EM offices or programs.





## BEMR/PLAN COST AND SCHEDULE COMPARISON

### ANL-E WASTE OPERATIONS ACTIVITIES

PLAN COST CATEGOR Y	BEMR COST	PLAN COST	BEMR COMPLETION	PLAN COMPLETION	REASON FOR DIFFERENCES	DIFFERENCE CATEGORY
TRU Waste	\$6,120K	\$2,325K	2022	1999	Program Transferred To ER In 2000	5
Mixed Waste	\$18,199 K	\$2,331K	2070	1999	Program Transferred To ER In 2000	5
Low Level Waste	\$102,912 K	\$7,463K	2070	1999	Program Transferred To ER In 2000	5
Hazardous Waste	\$54,750 K	\$3,144K	2070	1999	Program Transferred To ER In 2000	5
Special Case Waste	-	\$200K	NA	1999	Program Transferred To ER In 2000	5
Site Infra. Taxes Paid To Other Org.	-	\$645K	NA	1999	New category in TYP. Program Transferred To ER In 2000	5
Other Cost Cat. & Program Mgmt	\$495,840 K	\$7,599K	2070	1999	Program Transferred To ER In 2000	5
Total	\$677,821 K	\$23,707K	2070	1999	Program Transferred To ER In 2000	5

BNL WASTE OPERATIONS ACTIVITIES

PLAN COST CATEGOR Y	BEMR COST	PLAN COST	BEMR COMPLETION	PLAN COMPLETION	REASON FOR DIFFERENCES	DIFFERENCE CATEGORY
Mixed Waste	\$750K	\$305K	2010	1999	Program Transferred To ER In 2000	5
Low Level Waste	\$136,278 K	\$5,587K	2070	1999	Program Transferred To ER In 2000	5
Hazardous Waste	\$67,875	\$2,510K	2070	1999	Program Transferred To ER In 2000	5
Site Infra. Taxes Paid To Other Organ.	-	\$4,308	NA	1999	Program Transferred To ER In 2000	5
Other Cost Categories & Program Mgmt	\$320,820 K	\$4,409K	2070	1999	Program Transferred To ER In 2000	5
Total	\$525,723 K	\$17,119K	2070	1999	Program Transferred To ER In 2000	5

## BEMR/PLAN COST AND SCHEDULE COMPARISON

### PPPL WASTE OPERATIONS ACTIVITIES

PLAN COST CATEGORY	BEMR COST	PLAN COST	BEMR COMPLETION	PLAN COMPLETION	REASON FOR DIFFERENCES	DIFFERENCE CATEGORY
Mixed Waste	\$0K	\$633K	2070	1999	Potential Mixed Waste Not Included In BEMR. Program Transferred To ER In 2000	5
Low Level Waste	\$43,184K	\$1,892K	2070	1999	Program Transferred To ER In 2000	5
Hazardous Waste	\$42,150	\$2,235K	NA	1999	Program Transferred To ER In 2000	5
Program Mgmt	\$176,895 K	\$6,108K	2070	1999	Program Transferred To ER In 2000	5
Total	\$262,229 K	\$10,868 K	2070	1999	Program Transferred To ER In 2000	5

### AMES WASTE OPERATIONS ACTIVITIES

PLAN COST CATEGORY	BEMR COST	PLAN COST	BEMR COMPLETION	PLAN COMPLETION	REASON FOR DIFFERENCES	DIFFERENCE CATEGORY
Low Level Waste	\$5,310K	\$356K	2070	1999	Program Transferred To ER In 2000	5
Hazardous Waste	\$4,195K	\$433K	2070	1999	Program Transferred To ER In 2000	5
Other Cost Categories & Program Mgmt	\$13,950 K	\$156K	2070	1999	Program Transferred To ER In 2000	5

Total	\$23,455 K	\$945K	2070	1999	Program Transferred To ER In 2000	5
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## BEMR VS PLAN SITE END STATE DIFFERENCES

### Chicago Operations Office

END STATE ELEMENT	PLAN END STATE	BEMR END STATE	PLAN COST DIFFERENCE	REASON FOR CHANGE END STATE
<b>Argonne National Laboratory-East</b>	Transfer of Waste Operations Program To Landlord in 2000	Waste Operations Continues As EM Program Until 2070	\$654,114K	Decision to Transfer Waste Operations Financial and Managerial Responsibility from EM to Landlord
<b>Brookhaven National Laboratory</b>	Transfer of Waste Operations Program To Landlord in 2000	Waste Operations Continues As EM Program Until 2070	\$508,604K	Decision to Transfer Waste Operations Financial and Managerial Responsibility from EM to Landlord
<b>Ames Laboratory</b>	Transfer of Waste Operations Program To Landlord in 2000	Waste Operations Continues As EM Program Until 2070	\$22,510K	Decision to Transfer Waste Operations Financial and Managerial Responsibility from EM to Landlord
<b>Princeton Plasma Physics Laboratory</b>	Transfer of Waste Operations Program To Landlord in 2000	Waste Operations Continues As EM Program Until 2070	\$251,361K	Decision to Transfer Waste Operations Financial and Managerial Responsibility from EM to Landlord

## Appendix IX

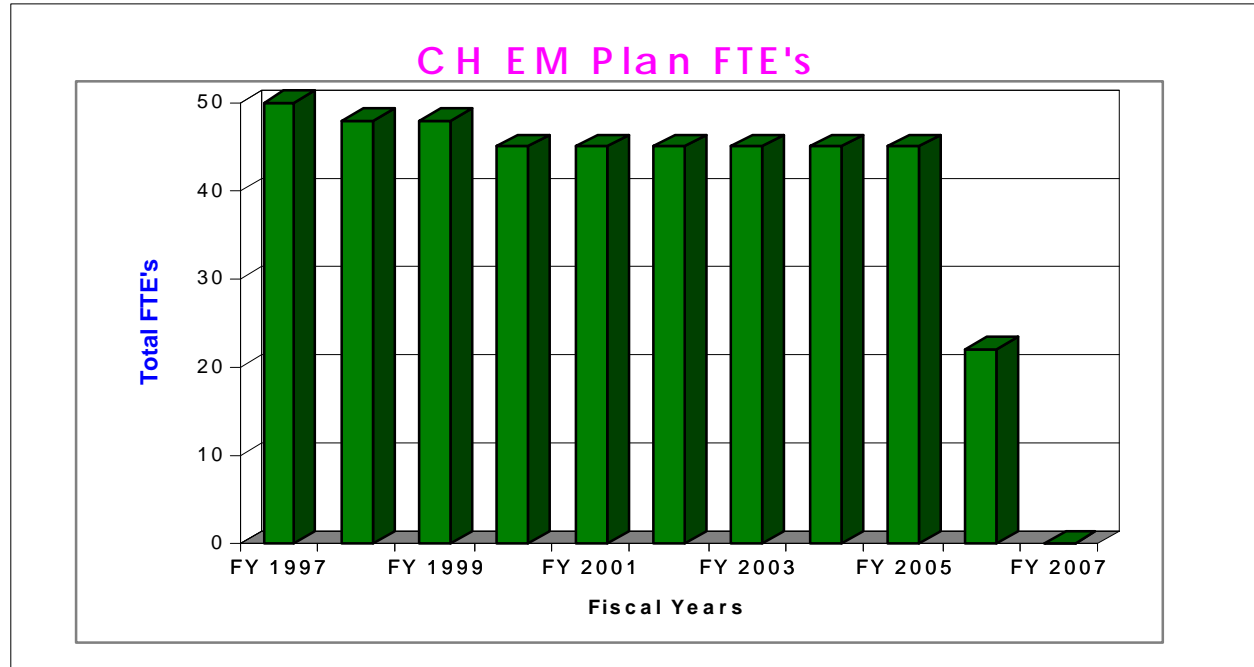
### FY 1999 Prioritization

			Cumulative
<b>Waste Operations</b>			
ANL-E	7,641		
BNL	5,637		
PPPL	3,623		
Ames	315	17,216	17,216
BNL-CERCLA Compliance		17,791	35,007
ANL-E RCRA Activities		6,488	41,495
Chicago S&M Activities		276	41,771
PPPL - Site C/D Remediation		267	42,038
ANL-W WAG 9		3,711	45,749
Princeton - Site A/B Payment		1,000	46,749
ANL-E - RCRA - Optimum Case		4,338	51,087
ANL-E D&D - Optimum Cast		8,675	59,762
BNL CERCLA - Optimum Case		3,782	63,544
Waste Ops - ANL-E		500	64,044
Waste Ops - BNL		100	64,144
Waste Ops - PPPL		2,309	66,453
Princeton - Site A/B Payment		1,909	68,362

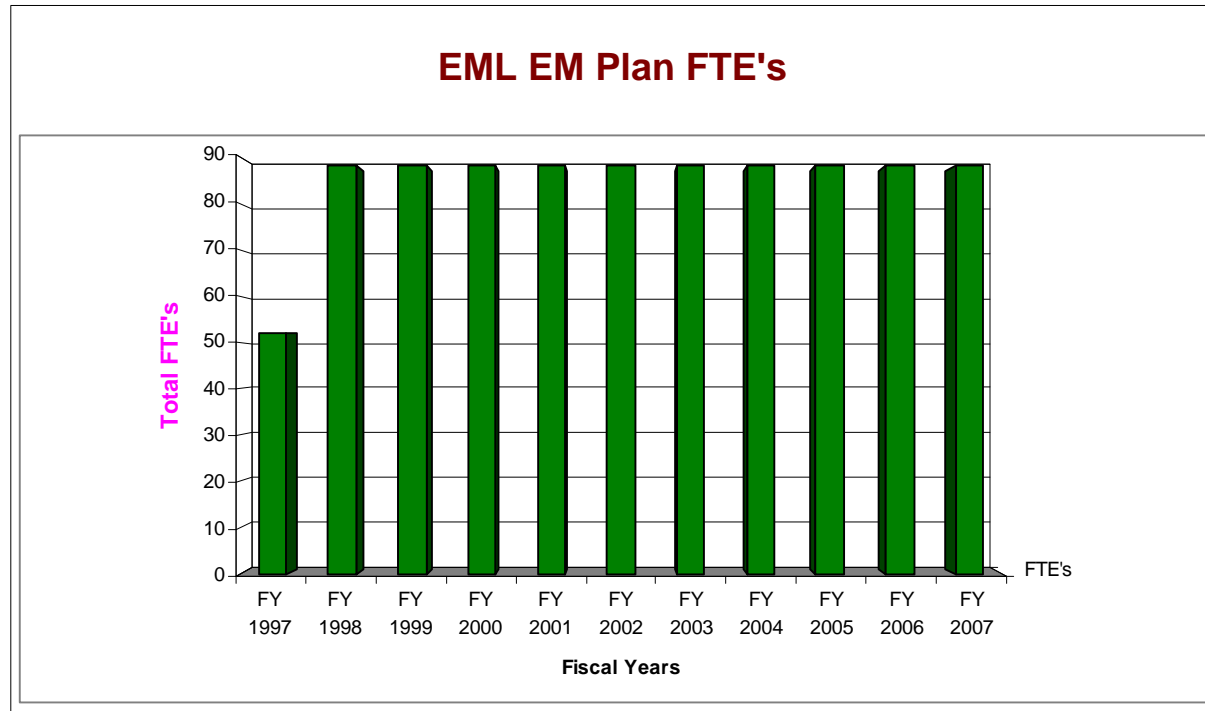
## Appendix X

### EM Staffing

CH only	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	
FTE'S	50	48	48	45	45	45	45	45	45	45	22	0



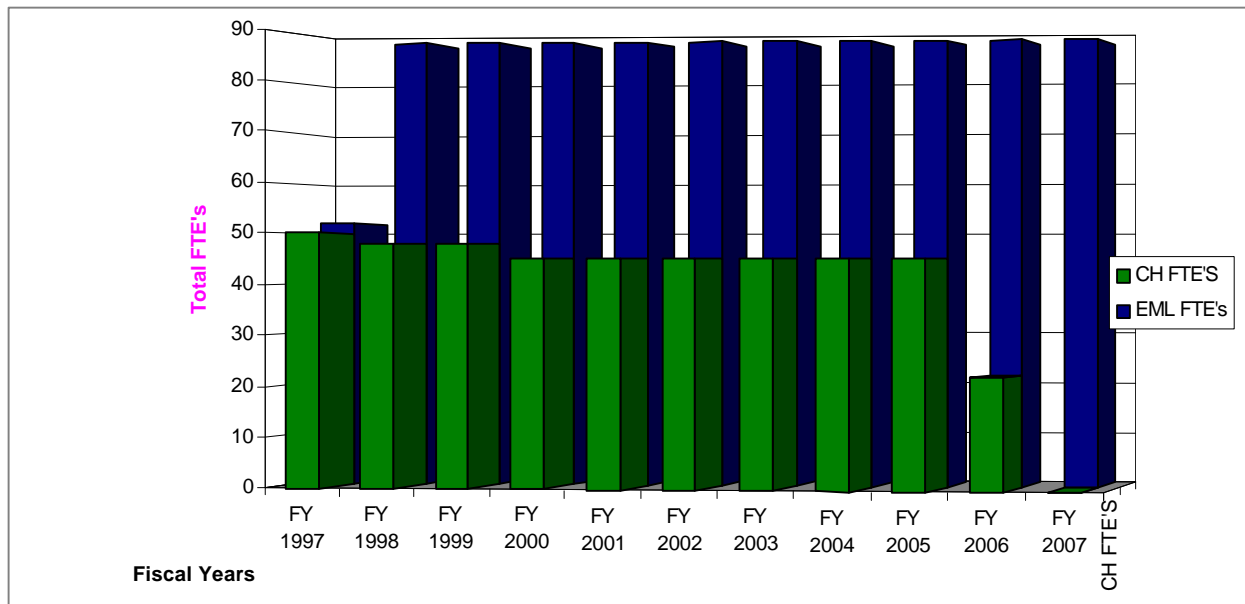
EML only	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	
FTE'	52	88	88	88	88	88	88	88	88	88	88	88





	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
EML FTE's	52	88	88	88	88	88	88	88	88	88	88
CH FTE'S	50	48	48	45	45	45	45	45	45	22	0

### Total EM Funded FTE's at CH



In Fiscal Year 1997 the current allocation of FTE's for EML is 52 and for CH is 50 for a total of 102. In FY 1998, according to the agreement between ER and EM, the FTE's for EML increase by 36 for a total of 88 FTE's, and CH's FTE's are reduced by 2 for a total of 48. (1 FTE for Fermi and 1 FTE for ANL-W) Both EML and CH's FTE levels remain constant for FY 1999 but in FY 2000 the CH total is reduced by 3 FTE's representing the reduction in the Waste Management Program. From FY 2001 through FY 2005 the FTE levels remain constant for both CH and EML. In FY 2006 the FTE level for CH is reduced by 23 FTE's to wind down the EM Programs at CH due to completion of the small sites under CH, and in FY 2007 the FTE level is zero. EML's FTE level is assumed to remain constant through FY 2007.

## **Environmental Measurements Laboratory (EML)**

**Mission and Role:** Established in 1947, EML is a GOGO lab which conducts investigations related to restoration, decommissioning and waste management while providing DOE and other Federal agencies with a readily available and objective in-hours capability to assess quality assurance, risk of human exposure to radioactivity, and related national security issues. Based upon the changing programmatic interests of the DOE and the desire to maintain the EML as a federal facility, a MOA transferred EML from ER to EM in May 1996. EML is the major quality assurance resource for environmental sampling and analysis for EM. The Laboratory also conducts international activities for EM including radiological characterization studies at nuclear reprocessing and the nuclear weapons test sites in Russia/FSU. EML participates in programs supported by NN related to the comprehensive Test Ban Treaty and the Non Proliferation Treaty. The Lab also operates and maintains a radioactivity sampling network with 140 dispersed global sites. The world-wide network is continuously poised to respond to atmospheric releases of radioactivity due to planned, clandestine or accidental events. EML also maintains the Human Subjects Research Database for DOE and also coordinates the Department's (EM, ER, DP) activities for the SERDP Program with DOD and EPA. EML's WFO customers include the Air Force, NRC, NASA and the IAEA satisfying needs tier organizations cannot meet.

**Facility and Budget Requirements:** EML is under the programmatic direction of EM and under the administrative direction of CH. The Lab is housed in a GSA building in lower Manhattan and has a current ceiling of 88 Full Time Equivalents (FTEs). The present onboard staff of 74 is comprised of 17 scientists/engineers with PhDs, 16 with MSs, and 13 with BA/BSs, and a remaining cadre of technicians and administrative/support employees. Because of the hiring freeze, the current number of on-board employees is ~74. The FY'97 budget is \$7.6M, 83% funded by DOE (EM, ER, NN), and 17% WFO (AF, NRC, NASA). (ER is providing transition funding for FY'97 as provided by the May 1996 MOA transferring EML to EM; EM has indicated its intent to provide a similar level of funding for EML in FY 1998). Approximately 60% of EML's Operating Budget is fixed cost allocated to salaries and benefits. Approximately 40% of EML's Operating Budget is for other operating costs including rent, security, supplies and environment, health and safety services.

## **Environmental Measurements Laboratory (EML) - continued**

**Previous Studies:** In December, 1996, after a thorough consideration of EML's future mission, Under secretary T.P. Grumbly authorized a "reinvention" for ANL to convert it into an EM directed facility with continuous improvements in the areas of business products and processes, developing and maintaining current and new customers, and redirecting the internal organization. EML is currently executing the action plan and is on-schedule. In May 1996 an MOA to delineate the overall management and financial responsibilities of ER and EM with respect to the transfer of EML from ER to EM was signed by M.A. Krebs, T.P. Grumbly and D.W. Pearman, Jr. The MOA was executed after a thorough review of the Laboratory, and upon a consensus of its customers of the inherent value of EML to the DOE, the nation and the international community and a finding that many of the labs activities were inherently governmental functions. In July 1993 ER along with EML's customers and stakeholders conducted an integrated technical and administrative review of the Laboratory. One of the conclusions of that review was that "The Laboratory is of definite value to the missions of the Department of Energy and the U.S. Government. It makes significant contributions to evaluations of importance to the national interest and is of increasing importance to EM, EH and other DOE offices, and other Federal Agencies". In 1981 the EML was critically reviewed by the DOE and found to be of significant value to the Department and National. This is witnessed by language in the House of Representatives Energy and Water Bill Appropriation bill, 1983-page 34, which stated that the activities of the EML are not to be contracted out.

**Statutory Mandates -** All laboratories performing environmental radiological analyses for EM are required to participate in the EML Quality Assurance Program by a Secretarial Memorandum (March 1993). The Office of Environment, Safety and Health (EH) mandates participation in the program (under DOE Order 5400.1, Ch4.10C) for laboratories that conduct analytical work in support of DOE environmental radiological monitoring programs.

## **Options for the Small Laboratories**

1) Maintain the status quo. The existing laboratory should be continued in its current configuration because its mission is determined to be a federal function or the contractual mechanism for operating the laboratory continues to be most appropriate.

2) Terminate the M&O contract and continue funding through a more appropriate contractual instrument:

a) a grants for specific areas of research and development. This option would permit a dismantling of the laboratory structure with a reliance upon the existing administrative systems of the recipient organization.

b) a cooperative agreement to continue the mission of the laboratory as a cohesive whole. A cooperative agreement would relieve the organization of many of the oversight, reporting, and systems requirements which are felt to be burdensome by many of the laboratories.

c) a cost reimbursable contract for non-R&D efforts. Like Option 2b, this alternative would relieve the contractor of many administrative burdens.

3) Privatize the laboratory through a sale of assets to a private entity. The Department could continue to fund work at the facility through grants or contracts with the private entity as mission needs would warrant.

4) Consolidation/merger. Move all or part of the existing operation to another facility or facilities.

5) Technical redirection. Reassess the capabilities and capacity of a given laboratory for possible use in fulfilling other programmatic needs of the Department.

6) Close the laboratory and transfer or sell the assets to other entities.

Note: Option 2 is not available to the Federal laboratories which are not currently funded under M&O contracts. Using alternative funding mechanisms would be possible if the laboratories were first privatized.

## **Appendix XI**

### **Stakeholder - Involvement Plan**

## **Chicago Operations Office's Public Participation Strategy for the Plan**

### **Introduction**

The purpose of this document will be to describe how the Chicago Operations Office (CH) will include stakeholders in the development of the its Plan. This plan is an umbrella document for those sites that comprise CH, including: Ames Group, Argonne Group, Brookhaven Group, Fermi Group, Princeton Group, Site A. Each CH site has a different level of stakeholder interest and thus, public involvement activities will be tailored to the individual needs of each site.

The goal of our outreach efforts will be to share information on plans for expedited cleanups, understand stakeholder concerns and issues, and incorporate their feedback into the CH plan.

Prior to the introduction of the Plan, CH had already set a goal of complete cleanup within ten years. In planning for an accelerated cleanup, stakeholder involvement was assumed as part of the process. It is these activities that are described below and can be considered part of the national stakeholder program for the Plan.

There are two issues that will be addressed in developing and executing an expedited cleanup plan for CH. First, it is possible that Argonne National Laboratory -west and Princeton Plasma Physics Laboratory may not be funded and will need to be decommissioned and decontaminated. As such, CH will have gained two new cleanup sites not originally planned for. This may impact the cleanup and funding schedule. Efforts will be taken to communicate to stakeholders these plans for a quicker cleanup.

CH will incorporate this project into the already existing public involvement framework at each site. Again, the message will focus on expedited cleanup per the CH schedule.

### **AMES**

For the most part, the EM program at Ames Laboratory is complete. There will be surveillance and monitoring of the Chemical Disposal Site (CDS) for the next two years. A Feasibility Study on the CDS has been released for public comment and little stakeholder interest resulted. There has been little stakeholder interest since the CDS project was completed last winter. A mailing list survey resulted in 80 Ames stakeholders asking to be removed from the mailing list. We will do mailings on the Plan as warranted. We will brief elected officials and regulators, and provide information to the media, as always.

### **Argonne**

Argonne will write an umbrella factsheet describing their EM program with a description of the Plan incorporated. This will be mailed to DOE/Argonne Group's entire mailing list. With the factsheet, DOE will offer to provide more information on the Plan if stakeholders request. In addition, DOE will let stakeholders know that the actual document can be found in the local information repositories and that their feedback on cleanup plans is welcomed and encouraged.

## Chicago Operations Office's Public Participation Strategy for the Plan

### **Argonne** (Continued)

DOE will also keep their Community Leaders Roundtable informed. The roundtable meets monthly. To date, the roundtable has shown little interest in the Plan. The roundtable has met twice, October 23 and December 4. Their next meeting is scheduled for January 8.

DOE has been in constant contact with the regulators and will continue to keep them informed as plans change.

### **Brookhaven**

DOE's Brookhaven Group has discussed the Plan with their regulators and will continue to do so.

DOE put a notice in the Lab's newsletter to the community, *Cleanupdate*, advertising the availability of the Brookhaven portion of the Plan for review and comment. At this time, key stakeholders will be provided with the plan. Key stakeholders include: regulators, the Lab's Community Working Group, and the civic associations. The plan will also be placed in the information repositories. Further information on the plan's availability will be given at a later date through the newsletter and possibly a mailing.

In addition, DOE and the Lab will continue to provide briefings to elected officials, the Community Working Group and civic associations on plans for Brookhaven's cleanup.

### **Fermilab**

Fermilab has a very limited environmental management program and an even smaller stakeholder following. Fermilab will brief their regulators and interested elected officials of their plans.

### **Princeton**

As with Fermilab, Princeton will also discuss plans with the University, their major stakeholder. If there is decontamination and decommissioning of the site, appropriate stakeholder activities will be developed and executed.

### **Site A**

Site A is in the process of completing its cleanup. As such, a plan is not applicable.

If you have any questions or would like additional information, please call Mary Jo Acke at (630) 252-8796.

## Appendix XII

### References

- Draft CH Waste Management Program Baseline Draft May, 1996
- PTS Data
- Monthly Reports
- ANL-E Current FY 1996 Year Work Plan
- ANL-W Current FY 1996 Year Work Plan
- BNL Current FY 1996 Year Work Plan
- Fermilab Current FY 1996 Year Work Plan
- PPPL Current FY 1996 Year Work Plan
- ANL-E&W Waste Management Baseline
- EM 30/40 Performance Measures Data
- BEMR Data
- CH Management Action Plan

### Argonne National Laboratory - West

- Operable Unit 9-04 - Comprehensive RI/FS Draft Work Plan 12/21/95.
- Operable Unit 9-04 - Final Scope of Work for the WAG 9 Comprehensive RI/FS 11/9/95.
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## **Appendix XII** (Continued)

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- ANL-62 - Sodium Boiler Building Hot Well
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- ANL-28 - EBR-II Sump
- ANL-30 - Sanitary Lift Station
- ANL-60 - Know a Butte Debris Pike
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## Appendix XII (Continued)

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